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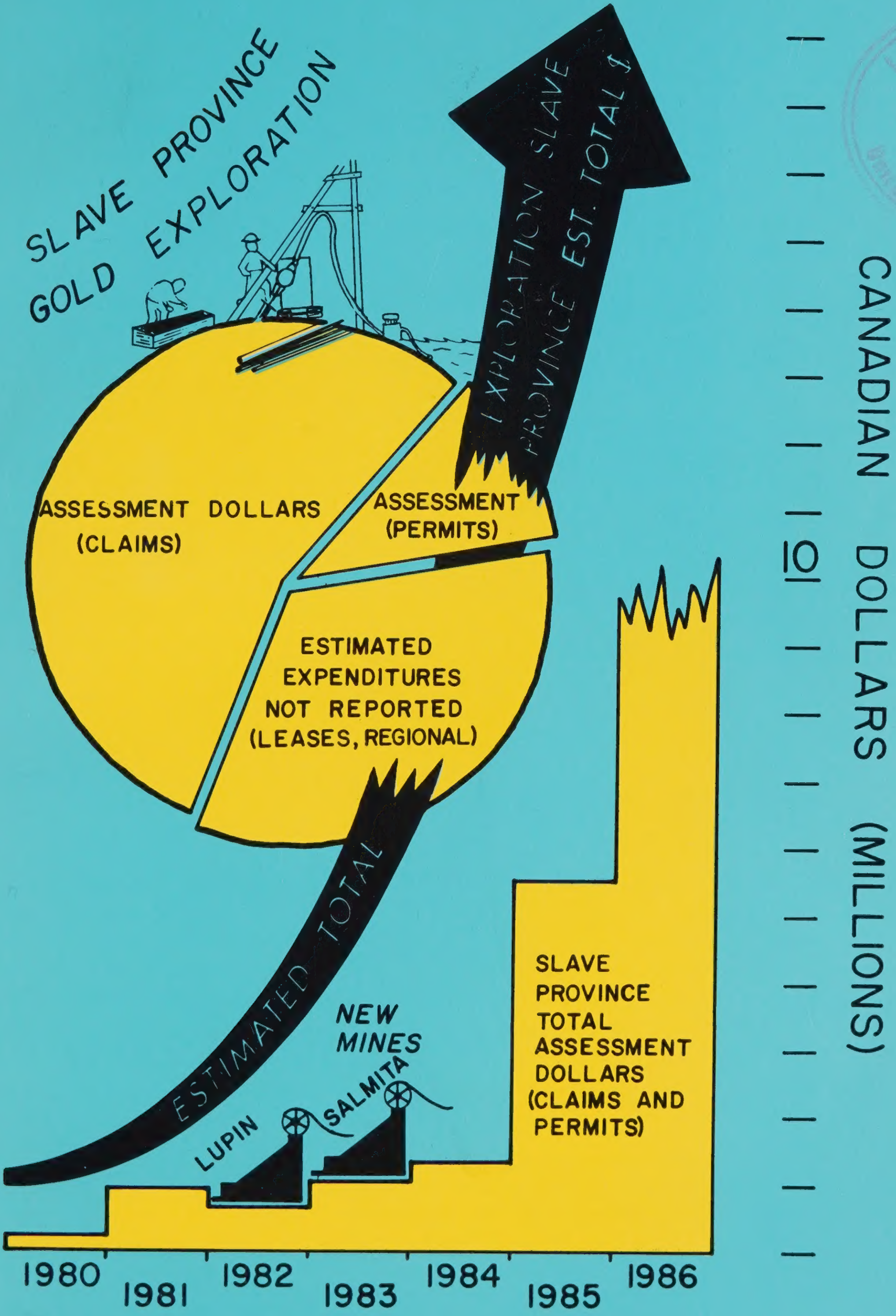
Mineral Industry report 1984-85
Northwest Territories



Canada

Mineral Industry Report 1984-85
Northwest Territories

J.A. Brophy
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RESUMÉ

INTRODUCTION

Le présent rapport traite de l'industrie d'exploration et d'exploitation minières des Territoires du Nord-Ouest (TNO) dans les années 1984 et 1985. Il a été rédigé à Yellowknife par le personnel de la Division de la Géologie du Programme des Affaires du Nord, ministère des Affaires Indiennes et du Nord Canada. Carol Ellis, géologue fonctionnel, a édité les contributions des auteurs de chaque chapitre.

ORGANIZATION DU RAPPORT

Le rapport comprend 8 chapitres. Le premier chapitre donne un sommaire de l'activité minierè et décrit la fonction et les activités de la Division de la Géologie. Le deuxième chapitre décrit la géologie et la production des mines en operation durant 1984 et 1985. Les 6 autres chapitres décrivent l'exploration minière dans chaqu'une des provinces et sous-provinces géologiques délimitées dans les TNO. Les provinces sont introduites, en guise de préface, par une brève description géologique et un aperçu de l'exploration dont elles ont fait l'objet. Les propriétés explorées dans chaque province ou sous-province sont généralement présentées selon le système national de cartographie.

Les descriptions des propriétés explorées sont composées de sept parties. Le TITRE comprend le nom de la compagnie a qui appartient la propriété, les métaux recherchés et l'emplacement de la propriété selon le système national de cartographie et les coordonnés de latitude et de longitude. La section REFERENCES comprend une liste des publications dans lesquelles sont décrit la géologie et les travaux effectués auparavant sur la propriété. En plus, on a ajouté les numéros des rapports d'évaluation des mines dont on s'est servi pour décrire les travaux effectués et les résultats obtenus. Les deux sections suivantes indiquent les noms des PROPRIETES explorées et leur EMPLACEMENT. La cinquième section décrit l'HISTOIRE de l'exploration sur la propriété et la sixième comprend une DESCRIPTION de la géologie et des gisements de minerai découverts auparavant. La dernière partie est une description des TRAVAUX EFFECTUES en 1984 et 1985 et des résultats de ces travaux. Puisque l'information inclue dans cette partie est abstraite des rapports d'évaluation des mines, la permission des compagnies a qui appartiennent les propriétés a été obtenue avant la publication de ce rapport.

APERCU GENERAL DE L'EXPLORATION

Le nombre de projets a été un peu plus en 1984 (116) et en 1985 (139) qu'en 1983 (115). La superficie jalonnée a décrut de 27% en 1984 (240,900 ha), mais a augmenté de 23% en 1985 (293,500 ha). Le nombre de permis de prospection émis en 1984 (25) et en 1985 (53) est moins qu'en 1983 (96).

L'or a été le métal le plus recherché. Le nombre de travaux entrepris dans la province des Esclaves en 1984 (57) et en 1985 (92) a continué à augmenter (44 en 1983). L'exploration dans la province d'Ours et la région sud-est du Mackenzie a decliné dramatiquement de 11 projets en 1983 a 3 projets en 1985, mais le nombre de projets dans les autres regions est resté stable.

APERCU GENERAL DE LA PRODUCTION MINIERE

Les onze mines des TNO ont produit $800 million de métaux en 1984 et $722 million en 1985, plus qu'en 1983, en dépit de le fermeture de la mine B-Zone en 1984, de la mine Silver Bear en avril 1985 et de la mine Shear Lake en août 1986.
La production d'or a continuée d'augmenter aux mines Lupin et Salmita. La production des metaux des autres mines est restée stable.

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CHAPTER 1
INTRODUCTION

W.A. Padgham,
Chief Geologist

This report describes mining and mineral exploration in the Northwest Territories (NWT) in 1984 and 1985. It was prepared by the staff of the Geology Division of the Northern Affairs Program, Department of Indian and Northern Affairs (DIAND), Yellowknife, NWT, and is one of a series of reports that are now produced biennially.

SUMMARY OF MINING AND MINERAL EXPLORATION

Until late in 1985 the NWT mining industry fared remarkably well throughout the mining recession that began in 1981. The decline in the price of silver,which brought to an end attempts to bring the Prairie Creek silver-base metal vein deposits of Cadillac Mines Ltd. to production, caused considerable problems for silver producers in the Great Bear Lake silver districts and by early 1985 all the mines in those districts had closed. Low tungsten prices and low demand for this metal forced Canada Tungsten Mining Ltd. to maintain production at its Cantung Mine below capacity for most of 1984 and 1985. Continued declines in the price and demand for lead and zinc accelerated late in 1985 and profitability of the main element of the NWT mining industry, its zinc mines, became questionable.

These negative effects on the NWT's mineral economy were offset considerably by increased production from the Salmita and Lupin gold mines. Production from the Polaris and Nanisivik mines which are on tide water, permitting their zinc-rich ores to remain competitive in world markets during periods of low demand and price, appear less sensitive to price and demand situations than does production at Pine Point.

Lower gold prices in 1985 and high production costs forced the Cullaton Lake operation to shut down in early September.

Exploration expenditures in 1984 were between $30 and $35 million. In 1985, this increased to nearly $45 million. Figures vary between reporting agencies because some report exploration expenditures in and around mines and others do not. Also, not all explorers make their expenditures known.

The re-deployment of mineral exploration effort, which began during the decline in exploration in 1981, was completed during 1984 and 1985. During this period, gold replaced uranium as the major target commodity. Gold exploration is carried out mainly by junior companies so that, although the total number of properties examined has not greatly diminished from the numbers for 1978 to 1980, the levels of expenditures have declined.

Uranium exploration expenditures which declined through 1983, appear to have stabilized, but at a very low level and now represent only about 10% of the total. Base metal exploration expenditures, which had maintained a healthy level mainly because of the search for additional ore reserves around the operating mines, were threatened by the precipitous decline in lead and zinc prices towards the end of 1985. Expenditures for gold exploration continued to increase. Interest in the coal resources of the high Arctic and, to a lesser extent, those of the Interior Platform and Cordillera, which had contributed significantly to exploration expenditures during 1982 and 1983, had ceased completely by 1984.

By the end of 1985, mineral exploration in the NWT appeared to have entered a phase of very unbalanced exploration effort with more than 75% of the expenditures on gold. Over the next five years development of a number of gold deposits of economic grade and tonnage can be expected.

Oil and gas exploration, which is monitored by COGLA (Canadian Oil and Gas Lands Administration) and not by the Geology Division, were important components of the mineral industry. Production increased significantly at Norman Wells with the completion of the pipeline to Alberta and field development continued during the review period. By the end of 1985, NWT oil production had expanded to ten times its former level. Gas production from the Pointed Mountain Field continued at the previous levels.

Oil and gas exploration, a major contributor to the northern economy, was confined mainly to younger fold belts of the NWT (Innuitian and Cordilleran) and to the Beaufort Sea/Mackenzie Delta, part of the continental shelf. Restructuring of the oil and gas land leasing system took place during the first few years of the eighties under the Petroleum Incentives Program.

MINERAL EXPLORATION MONITORING

Four geologists monitored non-hydrocarbon mineral exploration and mining during the review period.

P.J. Laporte monitored the District of Keewatin, which covers a large part of the Churchill Structural Province, including areas of metamorphically reworked Archean granite-greenstone terrain and extensive later volcanics and post-tectonic continental sandstones and conglomerates. Exploration for unconformity related uranium deposits continued in the latter terrain but at a much lower level than in 1982 and 1983. The main targets are areas believed to be close to the unconformity between the basement and the continental sediments. Gold exploration was concentrated on the reworked Archean and adjacent younger metamorphosed supracrustals.

J.B. Seaton, assisted by J.C. Crux, monitored activity in the Archean Slave and adjacent Proterozoic Bear Structural Provinces. The main target was gold, but also volcanogenic silver-base metal and rare metal pegmatites, in the Slave. Minor efforts continued to be expended on silver and uranium exploration in the Bear Province.

C.C. Lord, who monitored the NWT portion of the Cordillera and adjacent parts of the Interior Platform as far east as 128° W longitude, left the Division in October 1985. J.A. Brophy took charge of the Cordilleran District shortly thereafter. Targets in the Cordillera include tungsten and gold disseminated in and around intrusives along the Selwyn Basin-

Mackenzie Arch hinge zone and placer gold in the streams of the Liard-Nahanni drainage basin. Silver, shale-hosted lead-zinc, coal and barite are also potential targets, though little was done on these in the period under review.

The remainder of the NWT was monitored by W.A. Gibbins. His district includes: 1) the Pine Point mining district and adjacent parts of the Great Slave lowlands where targets are lead and zinc; 2) the East Arm of Great Slave Lake (Athapuscow Fold Belt) and related Proterozoic intrusives along the south edge of the Slave Province, where targets include uranium, silver, copper and, in the intrusives, rare metals; 3) the Churchill Province east of the Keewatin where the main target is uranium; and 4) the Arctic Islands where lead-zinc, coal, uranium, iron and rare-element pegmatites have been found. During 1984-85 there was little exploration in these parts of the Churchill Province or in the East Arm Fold Belt.

Because of the concentration of exploration into the Slave Structural Province, monitoring duties were reallocated early in 1986. Henceforth J.A. Brophy will attend to the southern part of the Slave Province to just beyond the Indin Lake and Courageous-MacKay Lake volcanic belts, and W.A. Gibbins that part of the Slave east of the Bathurst Trench. J.B. Seaton will continue to monitor the Bear Province and the rest of the Slave Province.

Mineral exploration expenditures and the number of properties examined in 1984-85 increased from the levels of 1982-83, and the number of exploration groups involved probably increased as well. This reflects the continued shift from base metal and uranium exploration, which had been dominated by large companies, to gold exploration, which attracts a higher proportion of prospectors, smaller exploration groups and junior mining companies. In 1984, 66% of 116 projects (77) were for gold and in 1985, 68% of 139 projects (95) were for gold (Table 1-1). Table 1-1 relates projects and commodities to the main area and predominant age of rocks containing the target commodities. Table 1-2 shows where the exploration took place within the various NWT districts.

Because of large expenditures in the Pine Point District and around Nanisivik, a considerable amount (probably at least $6 million each year) was expended on base-metal exploration. More than half of this was spent in the Pine Point District. Expenditures on uranium exploration continued to decline and were probably down to $3 million in 1984-85.

In 1984-85, a rare-metal project in the Blatchford Lake complex on the edge of the East Arm Subprovince cost approximately $2 million.

Expenditures on gold exploration and gold property (mine) development probably averaged about $24 million in the NWT during 1984 and 1985, up significantly from previous years.

Table 1-2 shows the shift of exploration from area to area as different commodities, base metals, uranium and gold became major targets between 1975 and 1985. Pine Point, the Arctic Islands and the Cordillera are primarily base metal areas; the Bear and Churchill provinces primarily uranium. The Slave Province hosts as yet uneconomic volcanogenic base metal and silver-base metal deposits and numerous gold deposits, as does the Kaminak Volcanic Belt in the Keewatin.

Land acquisition (Tables 1-3A and 3B) was mainly in areas with gold potential, and exploration in these areas had increased dramatically during the period. Targets are mainly in the Slave Province, but also in the Cullaton Lake area and elsewhere in the Ennadai-Rankin (Kaminak) Volcanic Belt. Placers in the Liard Valley are also targets, but of limited potential.

TABLE 1-1: EXPLORATION PROJECTS BY TARGET COMMODITY

COMMODITY	AGE OF MAIN HOST ROCKS (GEOLOGICAL PROVINCE)	YEAR 82	83	84	85
GOLD	ARCHEAN (Slave & Kaminak Subprov.); placer in Nahanni	25	53	77	95
URANIUM	PROTEROZOIC (Bear & Churchill)	36	25	16	8
SILVER	PROTEROZOIC (Bear)	3	9	3	4
BASE METALS	all ages	30	19	15	10
RARE METALS	ARCHEAN/PROTEROZOIC/ CRETACEOUS (Slave-Bear-Cordillera)	15	7	3	15
COAL	CRETACEOUS/TERTIARY	2	1	1	0
MISCELLANEOUS		2	1	1	7
TOTALS		113	115	116	139

Table 1-4 shows higher cost projects that include drilling (29 projects in 1984 and 35 in 1985), a significant decrease compared to the previous six years. Mining development was also down significantly in 1984, although it increased to five projects in 1985; two of these are on small satellite orebodies on the Giant Mines property. Most of the development is on small-scale gold operations that will not add greatly to value of production.

MINING LAND ACQUISITION

The NAP Mining Lands Division administers most aspects of mineral rights tenure in NWT. Claim maps, mineral property maps and Territorial Resource Base Maps are available on the fourth floor of the Bellanca Building.

TABLE 1-2: COMPARISON OF ACTIVITY IN VARIOUS GEOLOGICAL PROVINCES AND SUBPROVINCES

NUMBER OF PROPERTIES EXPLORED EACH YEAR

GEOLOGICAL REGION	YEAR 75	76	77	78	79	80	81	82	83	84	85
CORDILLERA	25	28	13	14	21	29	24	12	11	11	7
ARCTIC ISLANDS*	8	9	6	8	4	7	24	16	11	17	13
KEEWATIN**	31	37	38	36	48	53	59	34	25	19	17
SE. MACKENZIE**	3	7	11	7	13	14	25	10	11	9	3
EAST ARM	10	7	2	7	6	4	14	3	1	1	2
PINE POINT	3	4	3	7	5	6	6	3	2	1	2
BEAR PROVINCE	18	27	35	32	32	22	24	10	11	2	3
SLAVE PROVINCE	44	44	28	29	33	29	42	25	44	57	92
TOTALS	142	163	136	140	162	164	218	113	116	117	139

**Includes Baffin Island and Melville Peninsula, part of the Churchill Province, as well as the Arctic Archipelago.*
***Parts of the Churchill Structural Province.*

TABLE 1-3A: PROSPECTING PERMITS ISSUED 1976 TO 1985 IN VARIOUS GEOLOGICAL PROVINCES

	YEAR									
AREA	76	77	78	79	80	81	82	83	84	85
ARCTIC ISLANDS	0	0	10	0	10	2	53	87	10	15
CORDILLERAN PROV.	1	0	5	1	11	9	12	7	0	0
CHURCHILL PROV.	53	25	50	72	57	54	17	1	10	11
BEAR PROVINCE	13	8	10	26	17	4	3	0	0	5
SLAVE PROVINCE	1	1	0	0	3	4	6	1	5	22
TOTALS	68	34	75	99	98	73	91	96	25	53

The NWT is divided into three mining districts: Arctic and Hudson Bay, Mackenzie and the much smaller Nahanni District. Staking records and statistics relating to these areas are kept by the Mining Recorders of the Mining Lands Division. For this report these have been reassembled (Table 1-5) to show activity level by geological areas.

Mineral claim staking during 1984-85 was at the same levels as in the previous two years (1982-83), down significantly when compared to an average of 751,000 ha staked during the previous seven years. Fewer prospecting permits were issued during 1984-85 (Table 1-3A) and most were apparently obtained for gold potential.

The paucity of new prospecting permit applications in areas of uranium potential, the Baker-Thelon and Hornby basins, underscores the shift of exploration to other commodities. Claim staking was down significantly from 1983, from 330,000 ha to slightly more than 240,000 ha in 1984 and 290,000 ha in 1985. Most of this staking was for gold in the Slave Province.

Lapsing of old one unit (20.9 ha) claims continued to reduce the number of claims in good standing by approximately 10% per year, with very little change in the total area held as claims (Table 1-5). Thus, at the end of December 1985, the total number of claims stood at 30,398 and these covered 2,204,790 ha, whereas on December 31, 1983, 40,952 claims covered 3,114,606 ha, a 26% decline in the number of claims held but only a 13% decline in the area.

TABLE 1-4: HIGH COST PROJECT (DRILLING, MINE DEVELOPMENT)

	YEAR							
	78	79	80	81	82	83	84	85
DRILLING	52	61	81	58	45	54	29	35
MINE DEVELOPMENT	2	4	6	12	5	8	4	3
PRODUCING MINES	7	8	9	11	12	12	11	9
TOTALS	61	73	96	81	62	74	44	47

NORTHWEST TERRITORIES GEOLOGY DIVISION ACTIVITIES

The Northern Affairs Program of the Department of Indian and Northern Affairs administers for the Northwest Territories (NWT) what elsewhere are provincial level responsibilities for resources, land, economic development and environment, as these responsibilities have been retained by the Federal Government. The NWT Geology Division, stationed in Yellowknife, administers the provincial level responsibilities for geology and for the mining and mineral exploration industries within the territory.

Currently available details on over 100 exploration projects are described in the following sections by the Geology Division's District Geologists, who also monitor producing and developing mines in their respective Districts, a function they share with the Staff Geologist who prepared the chapter of this report recounting production and developments at the twelve mines that produced during 1984 and 1985. The Geology Division also conducts numerous projects to investigate the mineral potential and geological framework of the NWT. Projects conducted by Geology Division staff average 10 to 25 a year. These may be under the direction of any of the geologists on staff. In the past few years most were conducted by geology graduate students employed only during the summer months. These projects are listed in Tables 1-6A (1984) and 1-6B (1985).

TABLE 1-3B: GROUND STAKED DURING THE YEARS 1976 TO 1985 IN VARIOUS GEOLOGICAL PROVINCES IN THOUSANDS OF HECTARES

	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
Arctic Islands	0.9	1.4	82.1	16.0	9.7	3.0	22.8	4.0	29.4	0.5
Keewatin +	214.0	108.0	620.0	438.8	518.1	323.2	65.0	52.6	25.0	49.9
SE Mackenzie +	30.4	78.7	314.0	322.1	175.5	82.5	18.4	31.3	12.5	8.7
Slave Province	62.2	67.8	53.9	35.6	51.0	153.3	20.7	218.5	161.2	231.3
East Arm ×	1.5	2.1	2.6	11.1	0.02	11.2	0.1	--	--	0.1
Bear Province	45.0	170.0	84.6	171.8	40.0	21.0	6.7	13.3	0.2	1.2
Pine Point*	49.2	5.6	255.3	131.9	13.5	2.5	0.7	0.1	10.4	--
Cordillera	8.2	19.9	19.0	14.4	25.2	12.9	25.0	11.6	2.2	1.8
TOTALS	411.4	453.5	1431.5	1141.7	833.02	609.6	159.4	331.4	240.9	293.5

+ Churchill Province
× Bear Province
**Interior Platform*

Most extend for two or more years, and some are phases of larger comprehensive programs that last for many years. The Geology Division let twelve contracts to university geologists for geological investigations in 1984 and twelve in 1985 (Tables 1-7A and 1-7B). Some contracts are for projects that are done exclusively by the contractors but a number of contracts provide funds to permit a thesis professor to visit graduate students employed by the Geology Division to conduct a specific mapping project, which will also provide data for use in a thesis. In such cases the contract provides professional expertise and direction, that is commonly not available from Division Staff, to ensure a high standard of work is maintained. Products from both contracts and staff projects include maps and reports which are normally released as Economic Geology Series (EGS) open files. Preliminary reports are published in the Geology Division's yearly Overview of Mining, Exploration and Geology. Final reports are published in the recently initiated series "Contributions to the Geology of the Northwest Territories", are presented in theses at various universities, or are published in journals and symposia volumes.

Tables 1-7A and 1-7B list the contracts issued in 1984 and 1985, the principal workers and the products expected or received. Expediting service was provided out of Yellowknife for Geology Division field crews, ten Geological Survey of Canada field crews and a number of university-sponsored projects supported by the Geology Division.

During 1984, 24 Geology Division projects were underway in various parts of the NWT. Most of these projects continued over 1985. These are briefly described below, with references to that year. A division survey crew under the Project Geologist V.A. Jackson mapped parts of the Yellowknife Volcanic Belt to produce a detailed (1:10,000 scale) map of the Sito Lake area, covering part of the northern extension of the Yellowknife Volcanic Belt in the Quyta Lake area. This crew then moved north to Mistake Lake and mapped 76 M/11 on the Arctic Coast.

During 1985, the 25 field studies financially supported by the Geology Division were spread from the high Arctic (Baffin and Prince of Wales Island) to the Great Slave Lake area.

In the Keewatin, P.J. Laporte (District Geologist) mapped and sampled in the Tehek Lake area to assess the gold potential of the Ketyet River and Woodburn Lake Groups. Open file EGS 1985-11 reports the results of that study.

With Dr. D.D. Hogarth (University of Ottawa), W.A. Gibbins completed geological mapping of "Frobisher's Mine" in the Frobisher Bay area.

More than half of all the projects supported by the Geology Division were done in the Archean Slave Structural Province, where nearly 75% of all company- sponsored mineral exploration projects took place.

Nine field projects were conducted in or adjacent to the Yellowknife Volcanic Belt, host to the Con and Giant gold mines. H. Helmstaedt (Queen's University) is re-evaluating existing geological maps of the belt and preparing a new unified set of detailed maps (1:10,000 scale) and, as well, a new set of 1:50,000 scale maps of Yellowknife Bay, Prosperous Lake and Quyta Lake areas (NTS 85 J/8, 9 and 16). W.K. Fyson (University of Ottawa) continued a long-term project to unravel the complex structural history of the Slave Structural Province, particularly the Yellowknife Supergroup supracrustal component. G. Bailey (Queen's University) completed a study of the Jackson Lake Formation, probably the youngest sedimentary unit in the Yellowknife Volcanic Belt and studied adjacent Kam and Banting Group stratigraphy in order to define stratigraphic relationships at the top of the Kam Group. J.A. Brophy (NAP, Geology) finished detailed mapping of a small area of complex volcanic rocks that include the upper part of the Chan Formation and the lower part of the Crestaurum Formation, the bottom two units of the Kam Group (Helmstaedt and Padgham, 1986). W.A. Padgham reassessed exposures believed to represent the topmost part of that group (the Giant Section), just east of the Giant Mine plant and traced these units south to Kam Point. C. Relf mapped in detail the East and West Mirage Islands previously identified as representatives of the basaltic Kam Group, but now considered part of the overlying Banting Group, a considerably more felsic calc-alkaline volcanic cycle.

V.A. Jackson (NAP, Geology), assisted by a crew of 6 graduate and 4 undergraduate students, mapped most of the east half of the Hepburn Island Area (NTS 76/M). Preliminary

TABLE 1-5: CHANGES IN CLAIM HOLDINGS BY MINING DISTRICT - 1983 to 1985

MINING DISTRICT	GEOLOGICAL PROVINCE		CLAIMS (TOTAL)	HECTARES (TOTAL)	CLAIMS STAKED	HECTARES STAKED	CLAIMS LAPSED	HECTARES LAPSED
ARCTIC AND HUDSON BAY	CHURCHILL	1985	10,646	920,927	66	50,712	3,595	218,786
	INNUITIAN REGION	1984	14,175	1,089,001	81	54,405	1,324	212,011
	ARCTIC PLATFORM	1983	15,423	1,246,607	88	59,412	1,336	394,015
	BEAR (Northern part)	% Change from 1983	-31%	-26%	−25%	−15%	+169%	−44%
MACKENZIE	SLAVE, BEAR (main part + East Arm fold belt)	1985	17,738	1,704,885	392	242,336	3,364	255,784
		1984	19,950	1,691,437	395	184,475	2,604	244,707
	CHURCHILL (W part)	1983	22,919	1,751,669	430	260,291	3,399	320,523
	INTERIOR PLATFORM (Pine Point Dist.) CORDILLERA (north of Canol Rd.)	% Change from 1983	−23%	−3%	−9%	−7%	−1%	−20%
NAHANNI	CORDILLERA (Southwest part)	1985	2,014	78,978	3	1,839	392	20,648
		1984	2,403	97,787	12	2,020	219	20,563
		1983	2,610	116,330	29	10,889	236	29,432
		% Change from 1983	−23%	−32%	−90%	−83%	+66%	−30%

maps for 76 M/1, 2, 8, 9 and 16 will be released late in 1986.

A number of projects were undertaken in the Bear Structural Province. Professor D. St-Onge (Terrain Sciences, GSC and University of Ottawa) studied the surficial geology of Glacial Lake Coppermine and, with A. Mercier and D. Kerr (University of Ottawa), the glacial deposits of the Richardson River Valley.

Professor D.G.W. Smith (University of Alberta) continued studies of the mineralogy and chemistry of the Thor Lake rare-metal bearing deposits in the Aphebian Blatchford Lake alkaline intrusive complex that is just north of Hearne Channel on Great Slave Lake.

A program launched in September 1983 to obtain drill core representative of typical orebodies from each of the operating mines in the NWT continued. This core will be filed in the core library to provide a permanent, publicly available record of the NWT orebodies. Response from operating mines has been excellent and, upon completion, the core library should have a collection of considerable scientific value. It is also planned to obtain core representative of ore-bodies that supported mining in the past. Core has also been collected from a number of properties that have recently been drilled, and a number of properties drilled years ago were visited to see if any drill core was salvageable. Success in the latter case has been minimal, but this will be pursued in future years.

REPORT ORGANIZATION

The organization of this Mineral Industry Report is similar to that of the 1982-83 edition. Because of the concentration of exploration in the Slave Province the chapter on that province has three authors. This also reflects the recent reorganization of the Geology Division to divide the Slave Province between three district geologists, J.A. Brophy, W.A. Gibbins and

TABLE 1-6A: GEOLOGICAL FIELD WORK CONDUCTED BY NWT GEOLOGY DIVISION EMPLOYEES - 1984

PROJECT TITLE	GEOLOGICAL PROVINCE	PRODUCTS	STAFF	STATUS
Refinements of the geology of the YK Volcanic Belt	Slave (Mackenzie District)	1:10K compilation of Yellowknife Volcanic Belt (Mirage Islands to Clan Lake complex) & 1:50K maps Yellowknife Bay, Prosperous Lake and Clan Lake (85 J/8,9,16)	W.A. Padgham, Prof. H. Helmstaedt-mapping and compilation, Prof. S.A. Bowring (Wash. U. of St. Louis)-geochronology	Mapping 85% complete. Compilation and detailed studies underway. Papers on: stratigraphy, Can. J. E. Sci.; Sheeted dykes, Geology.
Sito Lake detailed geological mapping	Slave (North end YK Volcanic Belt)	1:10K and 1:50K geological maps Quyta Lake	summer staff directed by V. Jackson and assisted by H. Helmstaedt	Part of detailed YK Volcanic Belt mapping which is now 85% completed.
Mapping Long Lake area of Yellowknife Volcanic Belt	Slave (Mackenzie District)	Tourist's Guide and chapter in Yellowknife Guidebook to sheeted dyke complex at Long Lake	J.A. Brophy (Staff Geologist)	Field component completed September, 1984.
Relations of the Jackson Lake Fm. to the Kam and Banting Groups	Slave (Mackenzie District)	Report on stratigraphy. M.Sc. thesis, Yellowknife Bay and Prosperous Lake	G. Bailey (Queen's University)	Completion 1985-1986.
Geological mapping East and West Mirage Island Yellowknife Volcanic Belt	Slave (Mackenzie (District)	Report on stratigraphy and lithologies, MSc. thesis, Yellowknife Bay map revisions	C. Relf (Memorial University)	Field work begun mid August, 1984. Completion 1985.
Exploration of mafic rocks of Hope Bay Volcanic Belt	Slave (Mackenzie District)	Potential sources of carving stone evaluated for local carvers. Volcanic belt map for mineral exploration	W.A. Gibbins (Arctic Islands District Geologist)	Work to continue in 1985, 1986 and 1987.
Anialik River area (76M/11) mapping	Slave (Mackenzie District)	1:30K preliminary maps. Final maps: 1:50K of supracrustals and 1:20K of part of M/11, 1:250K of Hepburn Island 76/M	summer staff directed by V. Jackson with H. Helmstaedt and W.A. Padgham	Part of mapping of all of 76M. This to be completed in 1985 or 1986.
Investigation of turbidite-hosted gold deposits in Slave Province turbidite basins	Slave (Mackenzie District)	Some field work done for paper at GAC Symposium on turbidite-hosted gold deposits	W.A. Padgham	Paper on turbidite hosted quartz veins completed, for GAC symposium volume.
Judge Sissons Lake area mapping	Churchill (Keewatin)	1:30K preliminary map	P.J. Laporte (Keewatin District Geologist)	Ongoing.
Evaluation of Soapstone (carvingstone) sources in Foxe Basin	Churchill	Evaluate sources or potential sources of carving stone to assist local carvers.	W.A. Gibbins (Arctic Islands District Geologist)	Project ongoing, 1984 projects completed.
Geological mapping of volcanic sequences central Bear Province	Bear (Mackenzie District)	1:30K preliminary map. MSc. thesis, report	K. Pelletier (Carleton University) and others	Field work 90% complete, preliminary map released 1985.
Studies of Placer gold in the Liard River drainage basin	Cordillera (Nahanni District)	Description of placer showings and papers on genesis, evolution and sources of Au	C. Lord (Nahanni District Geologist)	Completed 1985.

Table 1-6B. GEOLOGICAL FIELD WORK CONDUCTED BY NWT GEOLOGY DIVISION EMPLOYEES - 1985

PROJECT TITLE	GEOLOGICAL PROVINCE	PRODUCT	STAFF	STATUS
Yellowknife Volcanic Belt-detailed mapping	Slave	1:10K detailed maps 1:50K maps 85/J 8,9,16	H. Helmstaedt, W.A. Padgham, J.A. Brophy, C.E. Ellis, G. Bailey, V.A. Jackson (Quyta), C. Relf (Mirage Islands)	Quyta Lake and Mirage Island mapping completed 1985.
Banting-Kam Group/ Jackson Lake Fm. comparisons	Slave	Stratigraphy, structure and relations of units in upper part of the Yellowknife Volcanic Belt	G. Bailey	Ongoing
Mirage Islands	Slave	Detailed mapping and study of shear zones in West Mirage rocks	C. Relf	Field work completed
Quyta Lake detailed mapping	Slave	1:10K maps 1:50K Quyta Lake 85J/16	V.A. Jackson & summer staff	Mapping complete except for granitoids in 76M/NE.
Hepburn Island 76/M East half	Slave	1:30K preliminary maps, 1:50K final maps. Also contribute to 1:250K map of 76/M	V.A. Jackson & summer staff	
Reconnaissance, Hope Bay Volcanic Belt	Slave	Preparatory to detailed and 1:50K mapping in 1986	W.A. Gibbins	Ongoing. Abstract & paper at GAC meeting, 1986.
Turbidite-hosted gold-bearing quartz veins	Slave	Mapping of selected gold-bearing quartz veins in Yellowknife Basin	J.A. Brophy (W.K. Fyson)	Ongoing
Cameron River Volcanic Belt study	Slave	Structural studies of Cameron River Volcanics	R. Cullen	Ongoing
Surficial Geology parts of 76/M	Slave	Addition of surficial geology to bedrock maps	D. Kerr	Completed
Geochemical survey of Tehek Lake area	Churchill	Test gold potential of volcanics and iron formation	P.J. Laporte	Open file released
Mapping of selected gold showings	Slave	Document various types of gold showings in the Slave Province	J.B. Seaton	Ongoing

J.B. Seaton, in order to ensure more adequate coverage of mineral exploration.

DIVISION PUBLICATIONS

The Geology Division produces a dozen releases in the EGS series each year. A list of these in chronological order of release is included on the next page.

A number of releases in preparation in this series include maps displaying the geology of the Proterozoic Nonacho Basin by L. Aspler. A 1:125,000 compilation of the whole basin has been released. More detailed (1:50,000) maps of the basin are in preparation.

A set of compilations of the geology of the Yellowknife Volcanic Belt, parts of 85 J/8,9 and 16, are in preparation. These will be produced at 1:10,000 scale and later compiled at 1:50,000 as part of new maps for Yellowknife Bay (85 J/8), Prosperous Lake (85 J/9) and Quyta Lake (85 J/16).

The following maps are expected to be open filed in 1986:

Geology of the Quyta Lake area, parts of NTS 85 J/9 and 16; by V.A. Jackson and others.

Geology of the West Mirage Islands, NWT, parts of NTS 85 J/7 and 8; by C. Relf and D.C. Nicolson.

Geology of parts of Hepburn Island area 76 M/1,2,8,9, 16 and parts of 15; by V.A. Jackson and others.

Geology, geomorphology and geocryology in the McDougall Pass area, Richardson Mountains, NWT and Yukon, parts of NTS 116 P/9,10 and 16; by J. Mattner.

Geology of Fenton Lake area of the Cameron River Volcanic Belt, parts of NTS 85 I/15, P/2; by R. Cullen.

Geology of the Bell Island Group, District of MacKenzie, parts of NTS 86 D/15,16, E/1; by I. Reichenbach.

Geology of the northeastern Outpost Islands, East Arm of Great Slave Lake; by C.D. Gault and J. Wahlroth.

Volume 3 of Contributions to the Geology of the Northwest Territories is also in preparation. Papers submitted for this volume include:

Geochemistry of Slave Province volcanic rocks, Yellowknife Belt; by A.M. Goodwin, University of Toronto.

Speculations on the origin of rare earth-carbonatite systems; by W.D. Groves, Archean Resources Corp., Vancouver, B.C., and P.J. Gannon, Geological Consultant, Vancouver, B.C.

TABLE 1-7A: GEOLOGICAL WORK DONE UNDER CONTRACT FOR NWT GEOLOGY DIVISION, NAP IN 1984

CONTRACTOR	AMOUNT	AGENT if not contractor	STUDENTS if any	PROJECT NAME OR PURPOSE	PRODUCTS OF CONTRACT, DESCRIPTION AND WHERE AVAILABLE
University of Alberta	5000	R. Kretz		Metamorphism and metasomatism of graywacke argillite and the Sparrow Pluton and associated pegmatites	Preliminary report in 1984 overview. Final report on Sparrow Lake Pluton and associated pegmatites in Contributions Vol. 2.
University of Alberta	6000	D. Smith	L.de St. Jorre	Mineralogy, chemistry, genesis, Thor Lake. Rare metal deposits Blachford Lake	Preliminary report 1984 overview. Talk at 1984 Geoscience Forum. Final report in Contributions Vol. 2.
University of Alberta	8000	B. Jones	F.W. Nentwich	Geological mapping of the Cape Crauford Formation, Brodeur Peninsula, Baffin Island	Preliminary report in 1984 overview. Final report in Contributions Vol. 2
Veekay Consultants Ltd.	1500	V.K. Prest		Study of Esker-Drumlin-Moraine complex west of Dismal Lakes, NWT	Final report Contributions Vol. 2 on eskers as a prospecting tool.
Queen's University	10000	H. Helmstaedt	G. Bailey	Stratigraphic studies, geological maps, YK Volcanic Belt	Abstracts in overview 1984, open file map EGS 1985-10. Talk at 1984 Geoscience Forum.
Washington University of St. Louis	9500	S.A. Bowring		Geochronology of Bear/Slave Provinces	Preliminary report in Contributions Vol. 2. Ph.D. thesis (Browining) received 1985. Various dates for Slave and Bear rocks provided.
Carleton University	9500	J. Moore	K. Pelletier	Mapping Calder River (Ellington Lake area)	Open file maps EGS 1985-9. Talk at 1984 Geoscience Forum.
University of Ottawa	7500	O. Dixon	I. Muir	Stratigraphy and sedimentology Imperial & Canol formations	Preliminary report in 1984 overview. Talk at 1984 Geoscience Forum. Final report submitted for Contributions Vol. 3.
Carleton University	9500	J.A. Donaldson	B. Johnson	Stratigraphic & economic studies, Wilson Island Group East Arm Great Slave Lake	Preliminary report in Contributions Vol. 2, final submitted for Contributions Vol. 3. M.Sc. expected by 1987.
University of Toronto	9500	A.M. Goodwin		Petrogenesis of Slave Province Volcanic Belts	Talk at 1984 Geoscience Forum. Final report submitted for Contributions Vol. 3.
University of Manitoba	3000	P. Cerny	M.A. Wise R.E. Meintzer	Litho-chemical studies of the YK pegmatite field	Abstract in 1984 overview. Final report in Contributions Vol. 2.
University of Ottawa	3000	D. St. Onge	D.E. Kerr	Surficial geology of the Richardson River Basin	Preliminary report in 1984 overview. Final report in Contributions Vol. 2.

Stratigraphy and structure of the early Proterozoic Wilson Island Group of Great Slave Lake: implications for its origin; by B.J. Johnson, Ottawa-Carleton Centre for Geoscience Studies.

The formation of gold deposits with particular reference to old rocks and Yellowknife; by R. Kerrich and W.S. Fyfe, University of Western Ontario.

Thrusting between the Cameron River greenstone belt and the Sleepy Dragon metamorphic complex, Slave Province, District of Mackenzie; by Timothy M. Kusky, Johns Hopkins University.

Geophysics and permafrost; by W.J. Scott, Hardy Associates (1978) Ltd.

Continental rifting - the petro-tectonic environment of Point and Redrock Lake basalts, Slave Province, NWT; by K. St. Seymour and P. Budkewitsch, Concordia University.

LIST OF PUBLICATIONS AVAILABLE FROM THE GEOLOGY DIVISION, NORTHERN AFFAIRS PROGRAM BOX 1500, YELLOWKNIFE, NORTHWEST TERRITORIES, X1A 2R3

Updated February 26, 1987

Please note: Orders must be accompanied by payment. Make cheques or money orders must be payable to: The Receiver General of Canada.

MINERAL INDUSTRY REPORTS (MIR)

MIR 1969-70 ($2.00)
Vol. 2, Northwest Territories, east of 104° W longitude; by P.J. Laporte; DIAND, 1974.

MIR 1969-70 (n/c)
Vol. 3, Northwest Territories, west of 104° W longitude; by T. Padgham, T.W. Caine, D.R. Hughes, C.W. Jefferson, M.M. Kennedy and J.D. Murphy; DIAND.

MIR 1971-72 ($2.50)
Vol. 2, Northwest Territories, east of 104° W longitude; by P.J. Laporte; DIAND, 1974.

TABLE 1-7B: GEOLOGICAL WORK DONE UNDER CONTRACT FOR NWT GEOLOGY DIVISION, NAP IN 1985

CONTRACTOR	AMOUNT	AGENT if not contractor	STUDENT if any	PROJECT NAME OR PURPOSE	PRODUCTS OF CONTRACT, DESCRIPTION AND WHERE AVAILABLE
University of Alberta	5000	D.G.W. Smith	L.de St.Jorre	Mineralogical and economic geology evaluations of the Thor Lake rare metal deposits	Poster displays, GAC Meeting Fredricton, CIMM Symposium on granite hosted metal dsposits, Geoscience Forum. M.Sc. thesis, (de St.Jorre). Interim report in Overview.
University of Alberta	5000	R.D. Morton	S. Swatton	Economic geology studies of Bullmoose Lake Gold Deposit	Preliminary report in 85 Overview, M.Sc. & final report for Contributions Vol. 3 received.
Memorial University, Newfoundland	5000	T. Rivers	C. Relf	Geological mapping in the Mirage Islands: Stratigraphy, structure petrology, and economic geology	Preliminary report in 85 Overview, M.Sc. and final report in preparation. Large scale maps open filed 1986, thesis probably 1987.
University of Ottawa	9000	W.K. Fyson	R. Cullen	Geological mapping in part of the Cameron River Volcanic Belt and structural studies in the Yellownife Supracrustal Domain	Large scale geological map of a small part of the Cameron River V.B. and contributions the structural understanding of gold deposits in the Yellowknife District. A paper on structural successions in gold quartz veins in the Yellowknife Domain is in press (Can. J. of Earth Sci.). M.Sc. thesis (Cullen, in 1987).
University of Western Ontario	6000	W.S. Fyfe	D. Anderson	Geological mapping and studies in the Western Plutonic Complex to determine the origin of auriferous shears in the complex	Contribution to: 1:50K maps Yellowknife district, understanding of the relationship of the Western Plutonic Complex to the Yellowknife volcanics and their gold deposits Report in Contributions Vol. 3.
Concordia University	1000	K. St. Seymour		Geological mapping and sampling for geochemical, and metamorphic studies in the Point Lake area	Contribution to the understanding of the Itchen and Contwoyto Formations, host to the Lupin gold ore-body.
Carleton University	10000	J.A. Donaldson	B. Johnson	Mapping stratigraphic, structural and economic studies, Wilson Island Group, host to East Arm gold deposits.	Maps and stratigraphy of the Wilson Island Group submitted for open file. M.Sc. thesis and various papers in preparation.
Carleton University	6000	J. Blenkinsop	I. Reichenbach	Mapping, early Proterozoic Bell Island Group, Hottah Lake	1:25,000 scale maps of the Bell Island Group for open file. M.Sc. thesis is nearing completion.
H. Helmstaedt	10000		G. Bailey	Studies in the Yellowknife volcanic belt. Preparation of geological maps.	1:10K maps for all of the Yellowknife Volcanic belt in prep., as are 1:50K compilations. Some 1:10K maps released. M.Sc. thesis in prep. 3 papers on the Yellowknife district are in journals and symposia volumes (see Table 1-8 for details).
University of Ottawa	6000	D.D. Hogarth		Study carving stone resource of southern Baffin Island. Investigate Frobisher's mines	Evaluate: carving stone sources, areas potential for additional sources, assess usefulness of any stone found.
University of Toronto	7000	A.M. Goodwin		Geochemical sampling and analyses of Slave Province volcanic belts. Development of prospecting guides.	Develop rare element geochemical prospecting technique to make volcanic belt prospecting more efficient. Provide understanding of Archean volcanic belt development. A paper for Contributions Vol. 3.
University of Toronto	8000	W.M. Schwerdtner		Structural studies, to provide understanding of economic deposits in the Arctic Archipelago	Publications in various journals.
University of Manitoba	6500	P. Cerny	R. Meintzner M.A. Wise	Rare element, pegmatites and granite rocks, Yellowknife region	Paper on the granites and associated pegmatites submitted for Yellowknife Guidebook. Ph.D. and M.Sc. theses in preparation. Final results to be published in memoir on the Yellowknife Pegmatite field.
Washington University	6000	S.A. Bowring		Geochronological studies in the Slave and Bear Structural Provs.	Provision of geochronological data to develop geological framework for Slave Province miner belts.

MIR 1971-72 ($3.00)
Vol. 3, Northwest Territories, west of 104º W longitude; by W.A. Padgham, M.M. Kennedy, C.W. Jefferson, D.R. Hughes and J.D. Murphy; DIAND.

MIR 1973 ($3.75)
Northwest Territories; by W.A. Padgham, J.B. Seaton, P.J. Laporte and J.D. Murphy; DIAND.

MIR 1974 ($4.50)
Northwest Territories; by W.A. Gibbins, J.B. Seaton, P.J. Laporte, J.D. Murphy, E.J. Hurdle and W.A. Padgham; DIAND.

MIR 1975 ($6.00)
Northwest Territories; by P.J. Laporte, W.A. Gibbins, E.J. Hurdle, C.C. Lord, W.A. Padgham and J.B. Seaton; DIAND.

MIR 1976 ($6.00)
Northwest Territories; by C.C. Lord, P.J. Laporte, W.A. Gibbins, E.J. Hurdle, J.B. Seaton and W.A. Padgham; DIAND.

MIR 1977 ($6.00)
Northwest Territories; by C.C. Lord, P.J. Laporte, W.A. Gibbins, J.B. Seaton, J.A. Goodwin and W.A. Padgham; DIAND.

MIR 1978 ($7.50)
Northwest Territories; by J.A. Goodwin, P.J. Laporte, C.C. Lord, W.A. Gibbins, J.B. Seaton and W.A. Padgham; DIAND.

MIR 1979 ($7.50)
Northwest Territories; by J.A. Brophy, W.A. Gibbins, P.J. Laporte, C.C. Lord, W.A. Padgham and J.B. Seaton; DIAND.

MIR 1980-81 ($10.00)
Northwest Territories; by J.A. Brophy, W.A. Gibbins, P.J. Laporte, C.C. Lord, W.A. Padgham and J.B. Seaton; DIAND.

MIR 1982-83 ($10.00)
Northwest Territories; by J.A. Brophy, J.C. Crux, W.A. Gibbins, P.J. Laporte, C.C. Lord, W.A. Padgham and J.B. Seaton; DIAND.

CONTRIBUTIONS TO THE GEOLOGY OF THE NORTHWEST TERRITORIES

Contributions to the geology of the Northwest Territories, Vol. 1; J.A. Brophy, editor ($5.00).

Contributions to the geology of the Northwest Territories, Vol. 2; J.A. Brophy, editor ($6.95).

EXPLORATION OVERVIEWS

by staff of the Geology Division,
DIAND, Yellowknife, NWT

1974 (N/C)
Mineral exploration in the Northwest Territories.

1975 (N/C)
Mineral exploration in the Northwest Territories.

1976 (N/C)
Mineral exploration in the Northwest Territories.

1977 (N/C)
Mineral exploration in the Northwest Territories.

1978 (N/C)
Mineral exploration in the Northwest Territories.

1979 (N/C)
Mineral exploration in the Northwest Territories.

1980 (N/C)
Mineral exploration in the Northwest Territories.

1981 (N/C)
Mineral exploration in the Northwest Territories.

1982 (N/C)
Mineral exploration in the Northwest Territories.

1983 (N/C)
Mining, Exploration and Geological Investigations, Northwest Territories.

1984 (N/C)
Mining, Exploration and Geological Investigations, Northwest Territories.

1985 (N/C)
Mining, Exploration and Geological Investigations, Northwest Territories; J.C.E. Crux and C.E. Ellis, editors.

1986 (N/C)
Mining, Exploration and Geological Investigations, Northwest Territories; J.C.E. Crux, and C.D. Gault, editors.

OPEN FILE MAPS AND REPORTS ON THE NWT

by NWT Geology Division
DIAND, Yellowknife, NWT

GSC Open File 129 ($15.00)
Lake sediment geochemical sampling of the Yellowknife, Indin Lake and portions of Cameron River and Beaulieu River greenstone belts; by D. Nickerson (NTS 85B/6; 85 I/10,11,14,15,16; 86 B/1,2,3,4,8; 85 O/14; 86/1,2,8). 14 maps and 1 text.

GCS Open File 135 ($5.00)
Geology of Camsell River silver district, NTS 86 E/9; by R.J. Shegelski and J.D. Murphy. 2 maps and text. 1977 (N/C)

GSC Open File 179 ($2.00)
Preliminary geological map of Rankin Inlet, NTS 55 K/16; by P.J. Laporte and S.K. Frape. 1 map. Mineral exploration in the Northwest Territories.

GSC Open File 199 ($2.00)
Geological map of White Eagle Falls area, NTS 86 F/12; by W.A. Padgham, R.J. Shegelski, J.D. Murphy and C.W. Jefferson. 1 map. 1980 (N/C)

GSC Open File 208 ($2.00)
Geological map of High Lake area, NTS 76 M/7; by W.A. Padgham, R.J. Shegelski, D.R. Hughes and C.W. Jefferson. 1 map.

GSC Open File 239 ($4.00)
Geology of two base metal deposits in the Slave Structural Province (High Lake copper-zinc deposit, NTS 76 M/7, and Indian Mountain Lake zinc-lead-silver-copper deposit, NTS 75 M/2); by W.L. Johnson. 2 maps and text.

EGS 1975-1 ($3.00)
Preliminary geology of Index Lake area, NTS 76 G/3; scale 1:31,680; by W.A. Padgham, C.W. Jefferson, E.A. Ronayne and V.Z. Sterenberg. 1 map with marginal notes.

EGS 1975-2 ($3.00)
Preliminary geology of Agricola Lake area, NTS 76 G/12; scale 1:31,680; by W.A. Padgham, M.P.D. Bryan, C.W. Jefferson, E.A. Ronayne and V.Z. Sterenberg. 1 map with marginal notes.

EGS 1975-3 ($3.00)
Preliminary geology of parts of NTS 76 G/5; scale 1:31,680; by W.A. Padgham, V.Z. Sterenberg, M.P.D. Bryan, E.A. Ronayne and C.W. Jefferson. 1 map.

EGS 1976-1 ($3.00)
Preliminary geology of Heninga Lake area, NTS 65 H/16; scale 1:31,680; by K.R. Barrett and S.R. Leggett. 1 map. See also 1981-4

EGS 1976-2 ($3.00)
Preliminary geology of Ferguson Lake area, NTS 65 I/15; scale 1:31,680; by K.R. Barrett, P.J. Laporte and S.R. Leggett. 1 map.

EGS 1976-3 ($3.00)
A copper-nickel showing on the north shore of Baker Lake, parts of NTS 56 D/2,7; scales 1:15,840 and 1:1,000; by K.R. Barrett, P.J. Laporte and S.R. Leggett. 1 text and 2 figures.

EGS 1976-4 ($3.00)
Preliminary geology of NTS 76 K/2, part of the Hackett River Volcanic Belt; scale 1:31,680; by C.W. Jefferson, W.A. Padgham, M.P.D. Bryan, R.J. Shegelski, E.A. Ronayne, H. Vandor and L. Thorstad. 1 map with marginal notes.

EGS 1976-5 ($3.00)
Preliminary geology of NTS 76 F/9, part of the Hackett River Volcanic Belt; scale 1:31,680; by M.P.D. Bryan, W.A. Padgham, C.W. Jefferson, R.J. Shegelski, E.A. Ronayne, and H.L. Vandor. 1 map with marginal notes.

EGS 1976-6 ($3.00)
Preliminary geology of NTS 76 K/1, part of the Hackett River Volcanic Belt; scale 1:31,680; by M.P.D. Bryan, W.A. Padgham, C.W. Jefferson, R.J. Shegelski, E.A. Ronayne, H.L. Vandor and L.E. Thorstad. 1 map with marginal notes.

EGS 1976-7 ($3.00)
Preliminary geology of NTS 76 F/15, part of the Hackett River Volcanic Belt; scale 1:31,680; by C.W. Jefferson, R.J. Shegelski, M.P.D. Bryan, E.A. Ronayne, H.L. Vandor and L.E. Thorstad. 1 map with marginal notes.

EGS 1976-8 ($3.00)
Preliminary geology of NTS 76 F/16, part of the Hackett River Volcanic Belt; scale 1:31,680; by C.W. Jefferson, M.P.D. Bryan, W.A. Padgham, E.A. Ronayne, V.Z. Sterenberg, R.J. Shegelski, H.L. Vandor and L.E. Thorstad. 1 map with marginal notes.

EGS 1976-17 ($3.00)
Preliminary geology of NTS 86 I/1, part of the Takijug Lake area; scale 1:31,680; by R.S. Hyde, H.A. McLeod, B.T. Scribbins and S.L. Taylor. 1 map with marginal notes.

EGS 1976-18 ($3.00)
Preliminary geology of NTS 86 I/2, part of the Takijug Lake area; scale 1:31,680; by R.S. Hyde, H.A. McLeod, B.T. Scribbins and S.L. Taylor. 1 map with marginal notes.

EGS 1978-1 ($3.00)
Preliminary geology of Amer Lake, parts of NTS 66 H/7,10; scale 1:31,680; by P.J. Laporte, K.R. Barrett and G. Schwab. 1 map.

EGS 1978-2 ($8.00)
1977 exploration activity in the Keewatin District, geology and property ownership in seven active areas of the Keewatin; various scales; by P.J. Laporte. 8 maps and 1 index map.

EGS 1978-4 ($9.00/set, $3.00 each)
Preliminary geology of NTS 86 H/14,15,16, District of Mackenzie, NWT; scale 1:31,680; by A.F.S. Bau, L.B. Aspler and E.J. Hurdle. 3 maps with marginal notes.

EGS 1978-7 ($2.00)
Preliminary geologic map of the Echo Bay region, NWT, Canada, parts of NTS 86 E/16, F/13, K/4, L/1; scale 1:21,505; by R.S. Hildebrand and K. Kittleson. 1 map.

EGS 1978-8 ($3.00)
Surficial geology, permafrost and related engineering problems, Yellowknife area, part of 85 J/8; scale 1:6,000; by L.B. Aspler. 1 map and text.

EGS 1979-2 ($9.00/set; $3.00 each)
Preliminary geology of NTS 86 H/9,10,11; scale 1:31,680; by A.F.S. Bau, S.P. Goff, M.J. Yakey. 3 maps with marginal notes.

EGS 1979-3 ($3.00)
Litho-stratigraphic map of northeast half of Great Bear Lake, parts of 86 K/4,5, 86 L/1; scale 1:50,000; by R.S. Hildebrand. 1 map.

EGS 1979-7 ($3.00)
Preliminary geology of northern Courageous Lake area, parts of NTS 76 D/3,6; scale 1:12,000; by H. Dillon-Leitch. 1 map with marginal notes; also available at 1:25,000.

EGS 1979-9 ($3.00)
Preliminary geology of the southern end of the Yellowknife Greenstone Belt, parts of 85 J/7,8; scale 1:7,500; by H. Helmstaedt, J.A. Goodwin, J.G. Patterson and J. King. 1 map.

EGS 1979-10 ($4.00)
Preliminary geology map of the northern end of the Yellowknife Greenstone Belt, parts of 85 J/9; scale 1:8,500; compiled by L.M. Hauer. 2 maps; also available at 1:2,500.

EGS 1979-11 ($3.00)
Preliminary geology map of eastern Point Lake, parts of 86 H/1,2; scale 1:31,680; by J.A. Goodwin, H. Helmstaedt, J. King,. R. Boodle and S. Pinard. 1 map.

EGS 1979-12 ($4.00)
Preliminary geological map of the Amer Lake area, parts of NTS 66 H/7,10; scale 1:31,680; by Judith G. Patterson and K. Barrett. 1 map with marginal notes.

EGS 1980-1 ($3.00)
Petrographic study of rocks in the Amer Lake area, District of Keewatin, parts of NTS 66 H/10,7; scale 1:83,000; by J.G. Patterson. 1 map and text.

EGS 1980-2 ($2.50)
Stratigraphy, sedimentation & tectonism in the Hornby Bay and Dismal Lakes Groups, Proterozoic, NWT, NTS 86 J,K,L,M,N,O; by C. Kerans, G.M. Ross and J.A. Donaldson. 25 page report, excerpt from 1977 M.I.R.

EGS 1980-4 ($4.00)
Proposed mineral exploration activity, District of Keewatin, parts of NTS 55, 56, 65, 66; scale 1:1,000,000; by P.J. Laporte. 1 map with marginal notes.

EGS 1980-5 ($4.00)
Preliminary geology map of Banting and Walsh Lakes area, 85 J/9, scale 1″=800′; by H. Helmstaedt, J. King and R. Boodle. 1 map.

EGS 1980-9 ($4.00)
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Prospector's trail: A layperson's geological guide to the Fred Henne Park area. Designed for the non-geologist and illustrated with maps and sections, this report is an introduction to the geology of Fred Henne Park (part of NTS 85 J/8) and a geological guide to a four-km park trail that traverses the lower part of the Kam Formation; by J.A. Brophy. 1 text.

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CHAPTER 2
OPERATING MINES, 1984-85

John Brophy,
Cordilleran District Geologist

INTRODUCTION

Eleven mines treated ores at ten mills in the Northwest Territories (NWT) in 1984 (Fig. 2-1). These included six gold mines (Con, Giant, Salmita, Lupin, B-Zone and Shear Lake), three lead-zinc mines (Pine Point, Nanisivik and Polaris), one silver mine (Silver Bear) and one tungsten mine (Cantung). Royex Gold Mining Corporation's Shear Lake Mine in the Keewatin was the only newcomer in 1984, but declining gold prices forced it to close in August of 1985. Royex's neighbouring deposit, the B-Zone Mine, was closed in mid-1984 after activities shifted to Shear Lake. Another casualty was Terra Mines Limited's Silver Bear Mine in the Bear Structural Province, which was forced to close in April of 1985 because of declining silver prices. Summary information on the operating mines is given in Table 2-1, and metal production for the years 1983 to 1985 is tabulated in Table 2-2.

The NWT mines directly employed more than 2800 persons in 1984-85, about 13% of the NWT workforce. The NWT contribution to Canada's total metal output in 1984 included: tungsten 75%, lead 34%, zinc 30%, gold 15.5%, and silver 4.6%. The value of NWT metal production in 1984 was more than that individually of Manitoba, Saskatchewan, Alberta, the Yukon Territory and all of the Maritime Provinces except Newfoundland. Similar statistics are not available for 1985 at the time of writing.

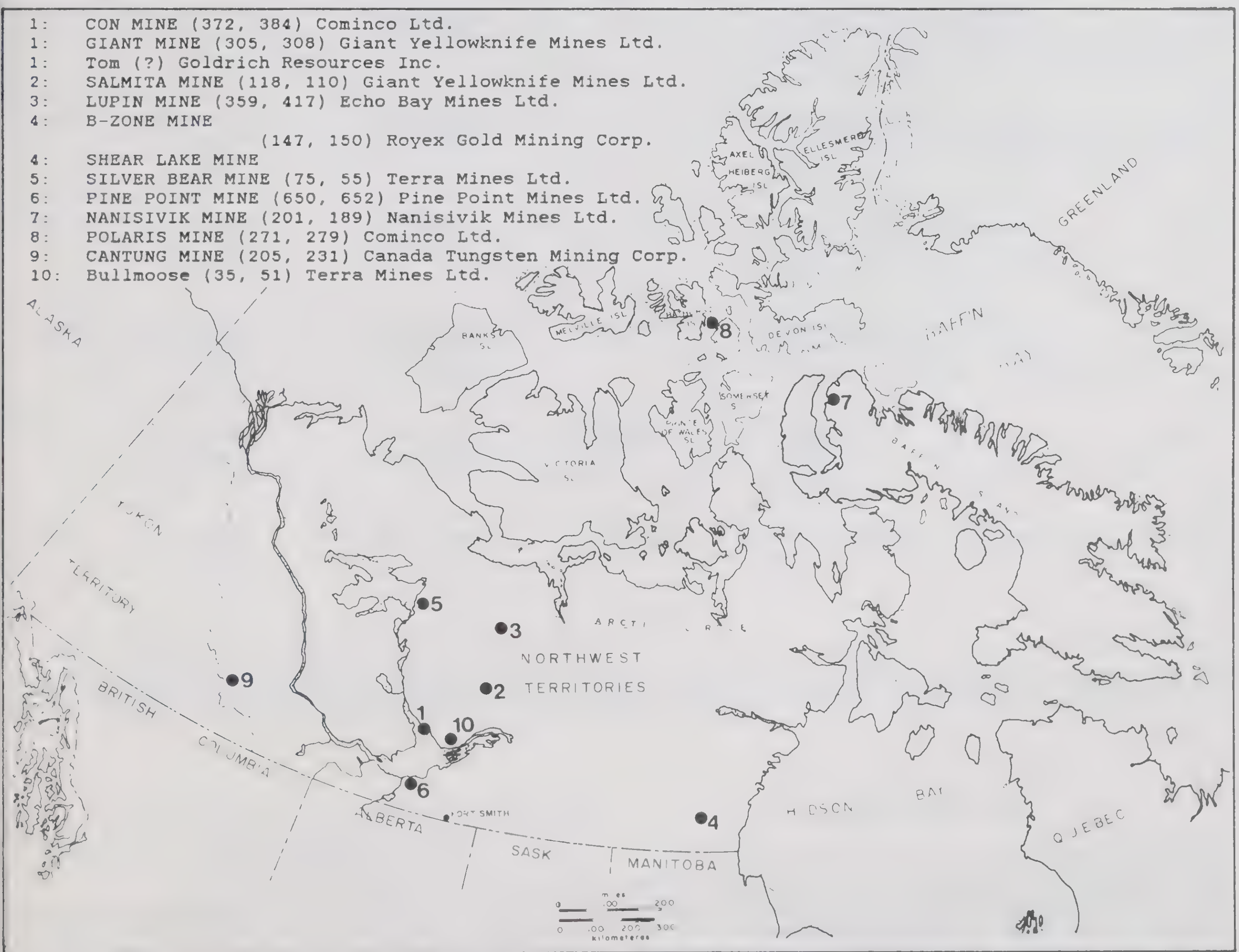

FIGURE 2-1: Key to operating and developing mines discussed in text. The table at upper left gives the mine name, operator's name, and the 1984 and 1985 workforce. Developing mines are in lower case.

TABLE 2-1: SUMMARY DATA, NWT MINES, 1984-1985

MINE	COMMODITY	1984 RATE	MILLED 1984	PROD'N 1984	JAN '85 RESERVES
Con	Au (Ag, As_2O_3)	612 tpd	223.6 kt	2772.0 kg Au 554.4 kg Ag 1269.0 t As_2O_3	1542.2 kt @ 14.4 g/t Au
Giant	Au (Ag, As_2O_3)	809 tpd	295.3 kt	1997.4 kg Au 340.8 kg Ag 3415.0 t As_2O_3	958.9 kt @ 8.23 g/t Au
Salmita	Au (Ag)	150 tpd	55.1 kt	1382.1 kg Au 262.4 kg Ag	79.8 kt @ 29.1 g/t Au
Lupin	Au (Ag)	1345 tpd	491.0 kt	5645.6 kg Au 820.0 kg Ag	3141.3 kt @ 12.2 g/t Au
B-Zone	Au (Ag)	—	52.1 kt Closed Mid-Year	450.0 kg Au 41.0 kg Ag	?
Shear Lake	Au (Ag)	381 tpd	87.2 kt	423.0 kg Au 27.0 kg Ag	?
Silver Bear	Ag	58 tpd	21.1 kt	24,620 kg Ag	?
Pine Point	Zn, Pb	6244 tpd	2,278.9 kt	163.4 kt Zn 51.1 kt Pb	21,772.3 kt @ 6.0% Zn 2.7% Pb
Nanisivik	Zn, PbZn, Pb Ag	1900 tpd	692.9 kt	67.7 kt Zn 7.0 kt Pb 27,061 kg Ag	3150.0 kt @ 9.5% Zn 0.5% Pb 48.0 g/t Ag
Polaris	Zn, Pb	2319 tpd	846.5 kt	110.5 kt Zn 28.4 kt Pb	19,958.0 kt @ 14.3% Zn 3.8% Pb
Cantung	WO_3	881 tpd	321.6 kt	3.53 kt WO_3	2541.0 kt @ 1.39% WO_3

Sources: Reserve figures are taken from company annual reports. Information on rates, throughput and production is taken from the Annual Mining Report of the Mining Inspection Service of the Government of the NWT. This report is compiled from information given to the Mining Inspection

1984 HIGHLIGHTS

The value of metal output in 1984 was a record $800 million (Table 2-2), 56% more than that of 1983 and 34% more than the previous record of $595 million set in 1982. Reasons for this improved performance were threefold:

1: After being forced to close for 5.5 months in 1983, Pine Point was able to resume full-scale production because of healthier lead and zinc prices in 1984 (Table 2-3).

2: After 11 months of supplying customers from inventory in 1983, the market for tungsten improved and Cantung was able to resume full-scale mining in 1984.

3: Despite the declining price of gold (Table 2-3), the value of gold produced in 1984 was more than that of the previous year because of increased output from Lupin and Salmita (Table 2-3).

1985 RATE	MILLED 1985	PROD'N 1985	JAN '86 RESERVES	GEOLOGICAL SYNOPSIS
555 tpd	202.7 kt	2526.3 kg Au 633.0 kg Ag 1141 t $As_2 0_3$	1360 kt @ 13.7 gt Au	Epigenitic metamorphic-hydro-thermal deposits in shear zones in Archean Yellowknife Bay Formation (upper Kam Group) mafic metavolcanics, Slave Province.
828 tpd	302.3 kt	2029.6 kg Au 567.7 kg Ag 2957 t $As_2 0_3$	964 kt @ 8.2 g/t Au	Same as above
176 tpd	64.5 kt	1981.2 kg Au 359.7 kg Ag	45 kt @ 37 g/t Au	Syngenetic-exhalative (?) deposit in quartz vein at contact between Yellowknife Supergroup metavolcanics and metasediments, Slave Province.
1564 tpd	570.9 kt	6069.4 kg Au 1186.1 kg Ag	2783.3 kt @ 11.66 g/t Au	Syngenetic-exhalative deposit in iron formation in Archean Contwoyto Formation metasediments, Slave Province.
	CLOSED	NONE	?	Syngenetic-exhaltative (?) deposit in iron formation in Archean Henik Group metasediments, Churchill Province.
341 tpd	82.1 kt Closed August	407.0 kg Au 34.5 kg Au	?	Epigenetic deposits in sub-vertical shears in the basal part of the the Aphebian Hurwitz Group quartzite, Churchill Province.
55 tpd	5.8 kt Closed April	6745.8 kg Ag	?	Epigenetic magmatic-hydrothermal deposits in fault zones in Aphebian Labine Group supracrustals and comagmatic intrusions, Bear Province.
5855 tpd	2137.3 kt	165.6 kt Zn 61.5 kt Pb	14,500 kt @ 6.7% Zn 2.7% Pb	Mississippi Valley-type deposits in karsted and dolomitized Middle Devonian Pine Point Group carbonates, Interior Platform.
1897 tpd	692.5 kt	61.0 kt Zn 5.1 kt Pb 23,512 kg Ag	Not Available	Mississippi Valley-type (?) deposits in Neohelikian Society Cliffs Formation dolostone, North Baffin Rift Zone.
2564 tpd	936.0 kt	117.8 kt Zn 30.0 kt Pb	19,000 kt @ 14.3% Zn 3.8% Pb	Mississippi Valley-type deposit in karsted and dolomitized Ordovician Thumb Mountain Formation carbonates, Arctic Platform
947 tpd	345.8 kt	3.72 kt WO_3	1.36 kt @ 1.24% WO_3	Skarns at contact between Cretaceous acid intrusion and Paleozoic limestone.

Service monthly by the mines. The rate, throughput and production figures are within 1% of similar figures published in company annual reports except for the following: Polaris reports 819.1 kt milled in 1984. Pine Point reports 46.2 kt Pb produced in 1984. Cantung reports 307.5 kt milled in 1984.

1985 HIGHLIGHTS

The year was marked by declining prices for all of the commodities mined in the NWT (Table 2-3). The value of metal output in 1985 declined 9.8% to $722 million, despite overall increased productivity. Lower gold and silver prices contributed to the closures of the Shear Lake gold mine and the Silver Bear silver mine. Nevertheless, gold output was up slightly from 1984 because of increases in the mill capacities at Lupin and Salmita. Reduced base-metal prices prompted Pine Point to announce that the mine might be forced to close as early as 1987.

TABLE 2-2: METAL PRODUCTION SUMMARY, NWT MINES, 1983-1985				
COMMODITY	MINE	1983 PROD'N ($ × 10^6)	($1984 PROD'N ($ × 10^6)	1985 PROD'N ($ × 10^6)
gold	Con	2219 kg	2772.0 kg	2526.3 kg
	Giant	1963 kg	1997.4 kg	2029.6 kg
	Salmita	159 kg	1382.1 kg	1981.2 kg
	Lupin	3758 kg	5645.6 kg	6069.4 kg
	B-Zone	1147 kg	450.0 kg	—
	Shear Lake	—	423.0 kg	407.0 kg
TOTAL Au		**9246 kg ($155.05)**	**12670.1 kg ($195.32)**	**13013.5 kg ($186.07)**
silver	Con	460 kg	554.4 kg	633.0 kg
	Giant	552 kg	340.8 kg	567.7 kg
	Salmita	32 kg	262.4 kg	359.7 kg
	Lupin	287 kg	820.0 kg	1186.1 kg
	B-Zone	24 kg	41.0 kg	—
	Shear Lake	—	27.0 kg	34.5 kg
	Silver Bear	45539 kg	24620.0 kg	6745.8 kg
	Nanisivik	26225 kg	27061.0 kg	23512.0 kg
TOTAL Ag		**73119 kg ($33.1)**	**53726.6 kg ($18.72)**	**33038.8 kg ($9.30)**
zinc	Pine Point	67.6 kt	163.4 kt	165.6 kt
	Nanisivik	61.0 kt	67.7 kt	61.0 kt
	Polaris	117.6 kt	110.5 kt	117.8 kt
TOTAL Zn		**246.2 kt ($283.26)**	**341.6 kt ($477.84)**	**344.4 kt ($430.28)**
lead	Pine Point	23.2 kt	51.1 kt	61.5 kt
	Nanisivik	6.4 kt	7.0 kt	5.1 kt
	Polaris	34.6 kt	28.4 kt	30.0 kt
TOTAL Pb		**64.2 kt ($37.84)**	**86.5 kt ($64.45)**	**96.6 kt ($56.04)**
TOTAL WO_3	**Cantung**	**0.35 kt ($3.76)**	**3.53 kt ($38.07)**	**3.72 kt ($38.60)**
arsenic trioxide	Con	0.25 kt	1.27 kt	1.14 kt
	Giant	0.73 kt	3.42 kt	2.96 kt
TOTAL As_2O_3		**0.98 kt ($0.60)**	**4.69 kt ($5.84)**	**4.10 kt ($1.70)**
TOTAL VALUE PROD'N (x10^6$)		$513.85	$800.2	$722.0

Source: Production figures from the Mining Inspection Service of the Government of the NWT. See footnote below Table 2-1 for details. Values calculated using the metal prices listed in Table 2-3. The total value of NWT mineral output is a subjective figure inasmuch as it does not account for factors such as smelter penalties on byproducts, selling forward and stockpiling. Arsenic-trioxide values are based on information from Con and Giant mines. The NWT also produces a small amount of by product cadmium and bismuth ($ 200,000/yr.).

FUTURE DEVELOPMENTS

Two new gold mines, Bullmoose and Tom (Fig. 2-1), are expected to come on stream in 1986. Both are turbidite-hosted quartz-vein deposits in Archean metasediments of the Yellowknife Supracrustal Basin. At Goldrich Resources Incorporated's Tom prospect, several kilometers north of Giant Mine, proven and probable reserves amount to 13,600 t grading 13.0 ppm Au (0.38 oz/ton). An additional 15,400 t of possible reserves grading 8.4 ppm Au (0.22 oz/ton) may be available. Underground development is currently in progress. At Terra Mines Limited's Bullmoose prospect, 85 km east-southeast of Yellowknife, proven and probable reserves of 97,500 t grading 11.9 ppm Au (0.35 oz/ton) have been outlined by drilling, trenching and underground development on more than a dozen veins. Possible reserves total 80,000 t grading 11.2 ppm Au (0.33 oz/ton). Construction of a test mill is in progress.

TABLE 2-3: AVERAGE ANNUAL PRICE OF METALS (CDN FUNDS)						
METAL	UNIT	1983($)	1984($)	1983-1984 % CHANGE	1985($)	1984-1985 % CHANGE
Gold	g (oz)	16.77 (521.59)	15.42 (479.49)	− 8.05%	14.30 (444.71)	− 7.26%
Silver	g (oz)	0.453 (14.08)	0.348 (10.84)	− 23.18%	0.282 (8.76)	− 18.97%
Zinc	kg (1b)	1.15 (0.523)	1.40 (0.636)	+ 21.74%	1.24 (0.568)	− 11.43%
Lead	kg (1b)	0.589 (0.268)	0.745 (0.339)	+ 26.49%	0.580 (0.263)	− 22.15%
$W0_3$	kg (1b)	10.79 (4.88)	10.79 (4.91)	− 0.47%	10.38 (4.72)	− 3.80%

Sources: Gold: *Northern Miner, Cdn banks bids average for 1984 and 1985 of weekly quotations*
Silver: *Northern Miner, Handy and Harman average for 1984 and 1985 of weekly quotations*
lead, zinc: *Northern Miner, Canadian market average for 1984 and 1985 of weekly quotations*
tungsten: *Canada Tungsten Mines*

CONTENT AND FORMAT OF CHAPTER 2

In this chapter, the operating mines are discussed in the same sequence as they are listed in Table 2-1. Because all of the mines that operated in 1984-85 were described and illustrated in detail in the Mineral Industry Report for 1982/83 (Brophy, 1985), the descriptions given here will be far briefer and will include comparatively fewer diagrams. A bibliography has been retained at the end of the chapter that includes not only those references cited in the text, but a comprehensive listing of papers pertaining to the mines and their environs. The SI (metric) system is used throughout this chapter. For those unfamiliar with the SI system, a list of relevant conversions to the Imperial system is given in Table 2-4.

TABLE 2-4: KEY TO ABBREVIATIONS AND METRIC/IMPERIAL CONVERSION TABLE

g = grams	31.103 g = 1 oz
t = tonnes	34.286 g/t = 1 oz/ton
tpd = tonnes per day	0.90718 Mt = 10^6 tons
Mt = megatonnes = 10^6 tonnes	0.90718 kt = 10^3 tons
kt = kilotonnes = 10^3 tonnes	1 g = 0.03215 oz
oz = troy ounces	1 g/t = 0.02917 oz/ton
ton = short ton	1 t = 1.1023 tons
	1 Mt = 1,102,311 tons
	1 kt = 1,102.31 tons

CON MINE

Cominco Ltd.
P.O. Box 2000
Yellowknife, NWT
X1A 2M1

Gold, Silver
85 J/8
Con shaft at:
62°26′22″N, 114°22′08″W

REFERENCES

Boyle (1961); Campbell (1947); Helmstaedt and Padgham (1986); Henderson (1985); Henderson and Brown (1966).

PROPERTY

CON 1-4; GG 1-14; MEG 1-10; MIDNIGHT 1; NEGUS 1-4; PIZ 1-2; P&G 1-4; ROSE; SOL 1-4; STAR 1-2.

LOCATION

The claims lie partly within Yellowknife's city limits. The mill is about 1.6 km south of the centre of Yellowknife.

HISTORY

The CON, P&G and NEGUS claims were staked between 1935 and 1937 after news of a gold discovery was announced by Dr. A.W. Jolliffe, a GSC geologist who was mapping the area. Cominco's production was first from the Con Mine on the CON group in 1938, and then from the Rycon Mine on the P&G group in 1939. The Negus Mine on the NEGUS group operated between 1939 and 1952 and was subsequently acquired by Cominco from Negus Mines Ltd. Today, the three mines are linked by underground workings and are referred to collectively as Con Mine. The remaining claims that adjoin the core CON-P&G-NEGUS groups were acquired mainly between 1936 and 1948. Deep drilling in 1944 intersected the Campbell Shear Zone east of the original mine workings. Since 1958, the bulk of Con's production has been from this zone. Between 1938 and 1985, Con Mine (including Rycon and Negus) has produced 120,871 kg of gold from 6,386 kt of ore for an average grade of 18.93 g/t Au.

DESCRIPTION

The mine workings are in the upper part of the Kam Formation (Henderson and Brown, 1966; Henderson, 1985), a 10- to 12-km wide, north-northeasterly striking, steeply dipping, homoclinal succession of Archean mafic flows and tuffs intruded by numerous dikes, sills and irregular bodies of gabbroic composition. Metamorphic grade ranges from greenschist in the upper part of the Kam to amphibolite at the base, where it is cut by the Western Granodiorite Complex (Fig. 2-2). Helmstaedt and Padgham (1986) have recently proposed a fourfold subdivision of the Kam and its elevation to Group status. According to their revised stratigraphy, most of the gold deposits in the Kam Group are in its uppermost formation, the Yellowkife Bay Formation.

Gold is hosted in shear zones cutting mafic volcanic flows of the Yellowknife Bay Formation. The largest and most productive of these is the Campbell Shear Zone, which strikes north-northeasterly, dips steeply west, is 60 to more than 300 m wide and has been traced along strike for about 8 km. The shear zone is open to the south under the waters of Yellowknife Bay and is cut off to the north by the north-trending West Bay Fault (Fig. 2-2). Resection of 5 km sinistral displacement along

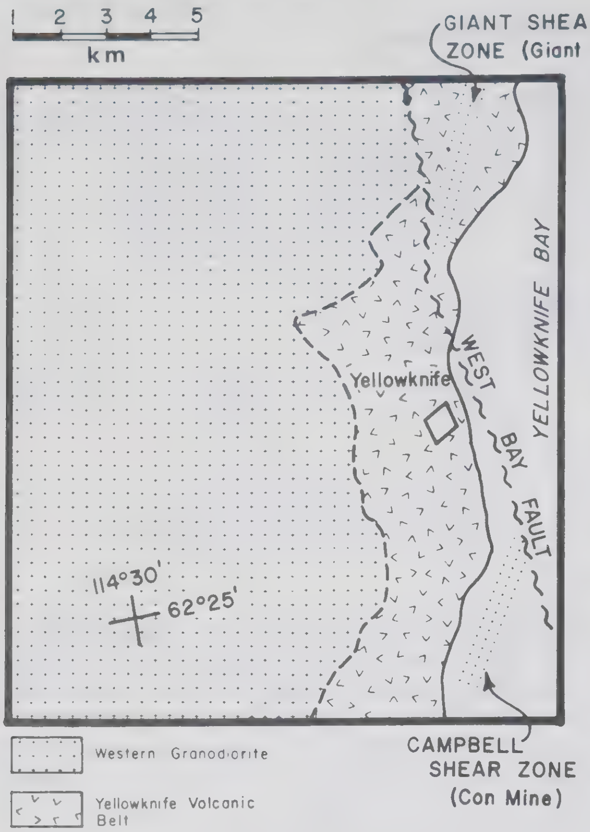

FIGURE 2-2: Simplified geology of the Yellowknife area showing the Giant and Campbell shear zones offset along the West Bay Fault.

this fault juxtaposes the Campbell Shear Zone against the Giant Shear Zone, the main productive zone at Giant Mine to the north of Yellowknife (Campbell, 1947). Boyle (1961) considered these major shear zones to be thrust faults and the mineralization to be metamorphic-hydrothermal in origin.

Ore shoots, which are typically 2 to 6 m wide and 90 m long, generally comprise lenses and veins of quartz that are enveloped by a narrow chlorite-carbonate-sericite-sulphide alteration halo and appear to have been emplaced in dilational parts of the shear system. Most of the gold now mined at Con is free milling and occurs as minute nuggets, films and plates in fractures, vugs and vein contacts.

In 1982, a plant to recover arsenic trioxide from wastes was completed, however, full production was delayed because of difficulties in attaining process specifications.

CURRENT WORK AND RESULTS

A ten-year summary of production and reserves at Con is given in Table 2-5, and a more detailed account of current production is given in Table 2-1.

A record amount of ore was milled in 1984. Lower production was achieved in 1985 because of time lost to install new hoist ropes in the Robertson Shaft, which was deepened from 1,653 to 1,900 m. The extended part of the shaft will enter full service in mid-1986 and will open up four new working levels to give access to at least 725 kt of ore grading about 13.7 g/t Au. Total cost of the shaft deepening project was $9.6 million.

In April of 1986, Cominco invited proposals for the purchase of Con Mine, announcing that the mine no longer suited Cominco's long-term business strategy.

TABLE 2-5: PRODUCTION AND RESERVES, CON, 1976-1985

	PRODUCTION		RESERVES	
Year	kt Mined	kg Au	Mt Reserves	Grade: g/t Au
1976	136	2800	1.33	20.3
1977	142	2900	1.48	19.9
1978	192	3550	1.50	19.6
1979	197	2950	1.63	17.9
1980	192	3000	2.00	16.8
1981	176	2300	1.90	16.8
1982	212	2470	1.90	16.1
1983	190	2220	1.72	15.1
1984	224	2770	1.54	14.4
1985	203	2530	1.36	13.7

GIANT MINE

Giant Yellowknife Mines Ltd.	Gold, Silver
Bag Service 3000	85 J/8, 9
Yellowknife, NWT	'C' Shaft at:
X1A 2M2	62º29'57"N, 114º21'40"W

REFERENCES

Boyle (1961); Campbell (1947); Helmstaedt and Padgham (1986); Henderson (1985); Henderson and Brown (1966); Padgham (1975).

PROPERTY

AES 27-50; 1 FB claim; GIANT 1-21; GIANT X1-X5; LAW 2-3; 6 LOLOR claims.

HISTORY

The claims were staked in 1935-1936 after news of a gold discovery was announced by Dr. A.W. Jolliffe, a GSC geologist who was mapping the area. In 1944, after almost a decade of exploration, Giant Yellowknife Mines Ltd. intersected the gold-bearing Giant Shear Zone (Fig. 2-2) under Baker Creek valley by drilling on the GIANT claims. The first gold brick from Giant Mine was poured in 1948. The company eventually acquired majority interest in the LOLOR and AES claims on which the Lolor and Supercrest mines were put into production in 1967, although together these have accounted for only 8.5% of the Giant operation's total mill feed. The three mines are now linked by underground workings and are usually referred to collectively as Giant Mine. Production from open pits began in 1974 and has accounted for as much as 40% of Giant's production in recent years. A plant to recover arsenic trioxide from wastes was completed in 1980.

DESCRIPTION

The geology of the mine area is similar to that previously described for the Con Mine, however, there are some differences between the ore deposits. Con ore zones tend to be narrower and shorter in plan length, but longer in dip length than those at Giant. The Campbell Shear Zone at Con is more

strongly sheared than the Giant Shear Zone, and most of the ore at Giant Mine is associated with arsenopyrite and is refractory (Padgham, 1975).

CURRENT WORK AND RESULTS

A ten-year summary of production and reserves at Giant is given in Table 2-6, and a more detailed account of current production is given in Table 2-1. During both 1984 and 1985, sufficient reserves were outlined to replace the ore that was mined. Current production and development data from the three individual mines are summarized in Table 2-7.

In 1984, a decline was completed to the DCW zone near the A shaft (Brophy, 1985). By year-end this zone was essentially mined out.

A decline was started from a portal in the B-2 Open Pit towards the UBC Zone, about 520 m to the west. This zone is unique because it is the only orebody in the Kam Group that is not in the Yellowknife Bay Formation, the uppermost formation. Rather, it is immediately below the underlying Townsite Formation in basaltic flows of the upper part of the Crestaurum Formation (Helmstaedt and Padgham, 1986). Although the UBC Zone is a shear, it differs from Giant's other auriferous shears in that sulphides are relatively sparse, carbonate-sericite alteration is poorly developed or absent, and the gold is free milling. The decline reached the UBC Zone at the 72-m-level by year-end 1985, and ore grade is expected to be 17.1 g/t Au across a mining width of 1.5 m and along a potential strike length of 46 m. A new surface crusher was installed in 1985 to handle ore from satellite orebodies (eg, UBC Zone) as well as mill feed from the open pits.

Another satellite orebody, the GKP Zone, is at the north end of the Supercrest Mine property. After drilling in 1984, a decline to the GKP Zone was advanced 350 m in 1985. Drill-indicated reserves are 36 kt grading about 12.0 g/t Au, of which 28 kt are on the Supercrest property and the remainder on Giant-controlled property to the north.

In 1984-85, six deep holes totalling 4960 m were drilled to test for possible ore-bearing structures underlying the Giant orebodies. Although sheared and altered rocks were encountered, no significant gold concentrations were intersected.

In 1985, one-third of 74 holes totalling 7800 m intersected ore-grade material across mineable widths on the Northbelt option, approximately 10 km north of the mill.

TABLE 2-6: PRODUCTION AND RESERVES, GIANT, 1976-1985

	PRODUCTION		RESERVES	
Year	kt Mined	kg Au	Mt Reserves	Grade: g/t Au
1976	390	3350	1.36	11.70
1977	405	3300	0.80	11.70
1978	360	2950	1.20	9.30
1979	380	2350	1.85	7.20
1980	205	1190	1.80	7.20
1981	360	1825	1.10	8.20
1982	366	2260	0.90	8.20
1983	297	1960	1.00	7.90
1984	295	2000	0.96	8.23
1985	302	2030	0.96	8.20

Giant celebrated the pouring of its 10,000th gold brick, in November of 1985, bringing total gold production since operations first began in 1948 to 179,314 kg from about 11,300 kt of ore for an average recovered grade of 15.87 g/t Au.

SALMITA MINE

Giant Yellowknife Mines Ltd.	Gold, Silver
Bag Service 3000	76 D/3
Yellowknife, NWT,	64º04'30"N,
X1A 2M2	111º14'30"W

REFERENCES

Dillon-Leitch (1984); Henderson (1944); Moore (1956); Ransom (1983).

PROPERTY

GIANT 1, JEJA 1-6; LT 1-3: LUFF 1-4; MAD 1-18; RED 24; REP 1-12; SALERNO 1-18; TOUGH 1-6; WIN 1-18.

LOCATION

Salmita is on the east shore of Matthews Lake, 240 km north-northeast of Yellowknife, to which it is seasonally connected by ice road. The mine is also serviced by a 1350 m gravel airstrip.

TABLE 2-7: PRODUCTION AND DEVELOPMENT; GIANT, LOLOR AND SUPERCREST MINES, 1984-1985

MINE	GOLD RECOVERY	GOLD OUTPUT	MILLED	GRADE g/t Au	RESERVES	RESERVE GRADE g/t Au	OPERATING COST $/g Au	LATERAL ADVANCE	DEFINITION DRILLING	FEED FROM OPEN PITS
GIANT 1984		1975 kg	290 kt	7.85	932.6 kt	8.23	12.92	4135 m	9390 m	40.9%
GIANT 1985		2030 kg	302 kt	7.82	909.9 kt	7.89	12.83	4320 m	7940 m	30.9%
LOLOR 1984		35 kg	5.3 kt	7.82	1.8 kt	8.23	13.71	minor	minor	
LOLOR 1985		none	none	—	1.8 kt	8.23	—	none	none	
SUPERCREST 1984		none	none	—	24.5 kt	11.66	—	none	none	
SUPERCREST 1985		none	none	—	*54.6 kt	12.34	—	*351 m		
TOTAL 1984	86%	2010 kg	295.3 kt		958.9 kt	8.23	12.94			40.9%
TOTAL 1985	85.9%	2030 kg	302 kt		964.3 kt	8.20	12.83			30.9%

**includes GKP zone. Source: Giant Yellowknife Mines Ltd. Annual Reports, 1984 and 1985.*

HISTORY

Most of the claims were staked between 1945 and 1951. After exploration and development by Salmita Northwest Mines Ltd. (1951-1952) and Bluebell Enterprises Ltd (1970-1973), the Salmita property (LT, LUFF, SALERNO and TUFF claims) was optioned to Giant Yellowknife Mines Ltd. in 1974. Exploration and development in 1975 and 1976 led to a feasibility study in 1981 which recommended extensive underground development. The southern claims (JEJA, MAD & REP claims) belonged to Tundra Gold Mines Ltd. and were the site of the Tundra Mine, which operated between 1964 and 1968. Giant acquired the Tundra property and refurbished the mill to treat Salmita ore. RED 24 is situated at 64°06'30''N, 111°15'W, several kilometers north of the other contiguous claims. RED 24 was transferred to Giant from Mr. Knud Rasmussen in 1973.

DESCRIPTION

Production from Salmita is mainly from the B-Vein, a steeply east-dipping, northerly trending 1.5- to 2.5-m-wide, 150 m long quartz vein that for the most part is stratiform between argillite on the footwall and meta-basalt on the hanging wall. In its regional context, the vein is stratigraphically associated with an interval of greenschist-facies felsic volcanics near the top of the predominantly mafic Courageous Lake-Mackay Lake Volcanic Belt (Dillon-Leitch, 1981; Henderson, 1944; Moore, 1956; see Fig. 2-3). Gold showings to the north of Salmita, on RED 24 and on property held jointly by Getty Mines Ltd. and Noranda, are hosted in this same package of felsic flows.

In the B-Vein, free-milling gold in the quartz vein is associated with minor sulphides and scheelite. Ransom (1983) suggested that the B-Vein might be a syngenetic deposit formed from solutions exhaled onto the sea floor. The stratiform nature of the deposit, the greater intensity of alteration (silicification, carbonatization and sulphidization) in the footwall, and the possible presence of a stringer zone in the footwall support his conclusions.

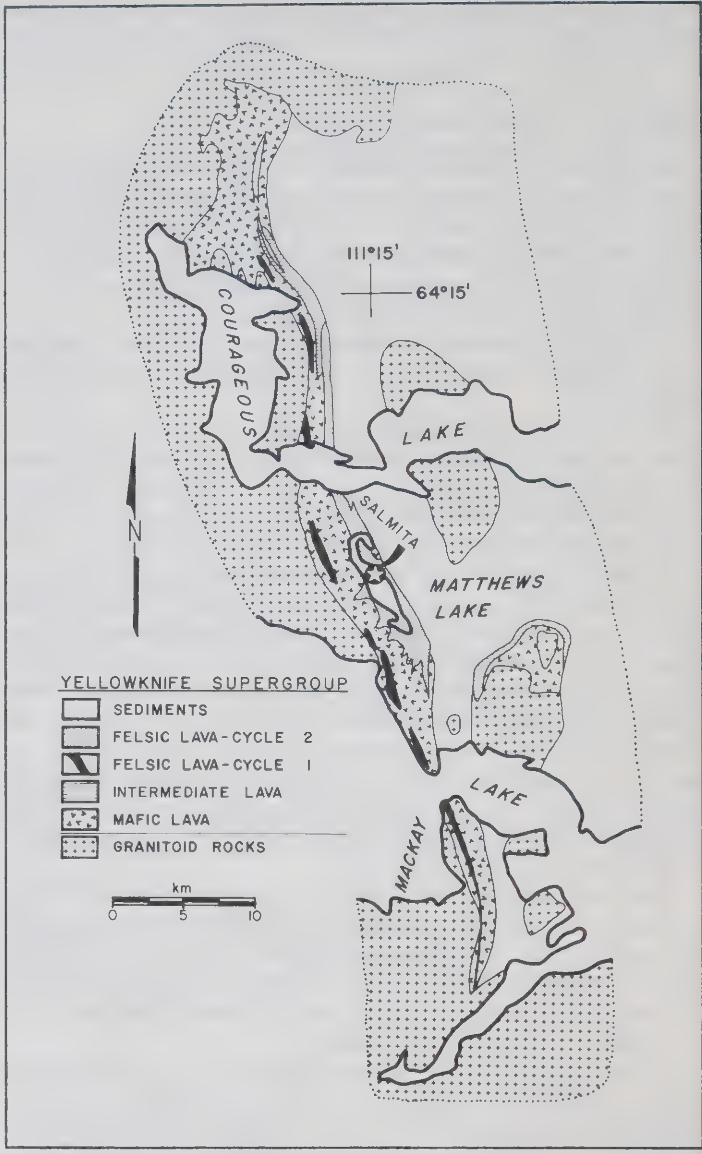

FIGURE 2-3: Simplified geology of the Courageous Lake-MacKay Lake volcanic belt (from Dillon-Leitch, 1981).

CURRENT WORK AND RESULTS

A summary of production and development data since Salmita operations first began in July of 1983 is given in Table 2-8. In 1984, the decline was advanced to the 6th (300-m) level and extraction headings were established on the 5th (250-m) level, where the vein is about 95 m long and up to 2.0 m wide. Drilling and development work on a parallel structure, the T Vein, was undertaken, but results were disappointing because gold is erratically distributed. Freeze-up problems

TABLE 2-8: PRODUCTION AND DEVELOPMENT DATA, SALMITA MINE, 1983-1985

Year	Gold Recovery	Gold Output	Milled	Grade g/t Au	Reserves	Reserve Grade g/t Au	Operating Cost per g/Au	Development
1983	85.3%	159 kg	11.9 kt	15.60	105.2 kt	28.10	—	Spiral ramp advanced to 4th (200-m) level.
1984	95.7%	1381 kg	55.1 kt	29.20	79.8 kt	29.10	$9.28	Ramp advanced to 6th (300-m) level. Underground drilling of 21 holes (1695 m).
1985	98%	1981 kg	64.5 kt	31.34	45.0 kt	37.00	$7.56	Ramp advanced to 7th (350-m) level, shaft sinking 424 m from winze on 6th level. Underground drilling of 37 holes (7691 m).

Source: Giant Yellowknife Mines Ltd. Annual Reports.

experienced in the ore bin in 1984 were resolved by installing a screen and using a larger ball mill.

Exploration in 1984 was conducted on Salmita property and on optioned ground to the south. Twenty-eight holes totalling 4266 m were drilled from surface on various showings. Encouraging gold intersections were obtained 1.1 km southeast of the mine, 2.3 km south of the Tundra mill, and to the north of the mine within 300 m of present workings.

In 1985, the ramp was extended to the 7th (350-m) level and an internal shaft was sunk 424 m from the 6th level. This shaft, which will extend to the 10th (500 m) level, will give access to a small, high-grade orebody identified by underground drilling between the 6th and 10th levels.

Exploration drilling in 1985 totalled 15,353 m in 129 holes. On RED 24 to the north of the Salmita property, 12,700 t of ore grading 19.54 g/t Au were outlined in felsic volcanic rocks adjacent to a diabase dike (personal communication; Salmita Division personnel). Results were not encouraging in follow-up drilling of other targets identified in 1984.

LUPIN MINE

Echo Bay Mines Ltd.	Gold, Silver
3300 Manulife Place	76 E/14
10180 101 St.	65°46′N, 111°13′30′W
Edmonton, Alta., T5J 3S4	

REFERENCES

Bostock (1980); Gibbins (1981); Kerswill and others (1983); Tremblay (1976).

PROPERTY

CONGO 1-9; 111 MOP claims; PAT 1-3.

LOCATION

Lupin is on the west shore of northern Contwoyto Lake, 402 km north-northeast of Yellowknife, to which it is connected seasonally by ice road. It is also serviced by a 1,525 m gravel airstrip.

HISTORY

The main showing was staked by a Canadian Nickel Company Limited (Canico) reconnaissance crew in 1960. The property was optioned to Echo Bay Mines Limited in 1979 and subsequently purchased subject to royalty payments. The first gold brick was poured in May, 1982.

DESCRIPTION

The Lupin Mine area is underlain by highly folded, greenschist-facies turbidites of the Archean Contwoyto Formation (Bostock, 1980; Tremblay, 1976; Fig. 2-4). Intercalated with the turbiditic arenites and argillites are scattered units of silicate, sulphide, and oxide-facies iron formation. Ore at Lupin is associated with a stratiform iron formation unit that includes both silicate and sulphide facies. The unit has been deformed into a tight, steeply north-plunging, Z-shaped fold whose three northerly trending limbs are referred to as the East, Centre and West zones (Fig. 2-5). Dips are steep and all zones have been traced along a strike length of about 300 m. The Centre Zone is the largest of the three and includes from 5 m to 25 m of mixed sulphide and silicate-facies iron formation. Ore-grade gold is in the sulphide facies, which comprises pyrrhotite (greater than 20%), grunerite, quartz and feldspar, as well as subordinate porphyroblastic arsenopyrite, loellingite and almandine garnet. The silicate facies is similar, but sulphide poor. Two types of ore have been recognized in sulphide-facies iron formation at Lupin: a uniformly distributed arsenic-poor type containing abundant finely layered pyrrhotite; and a more localized arsenopyrite and loellingite-rich type that is clearly restricted to the margins of late quartz veins and shear zones. In the former, most of the gold is disseminated as large grains (50 μm) adjacent to pyrrhotite. In the arsenic-rich type, finer-grained gold (20 μm or less) is mainly along arsenopyrite-loellingite grain boundaries (Kerswill and others, 1983). Gibbins (1981) and Kerswill and others (1983) consider that most of the features in the Lupin orebody are consistent with chemical sedimentation and syngenetic concentration of gold, silver, iron, sulfur and silica from hydrothermal fluids during deposition of the Lupin ore unit. Tremblay (1976), however, believes that the iron formation at Contwoyto Lake is clastic in origin.

CURRENT WORK AND RESULTS

Lupin 1984

Lower operating costs (Table 2-9) were achieved by a 50% expansion of mill capacity and throughput. This enabled the cut-off grade for economically recoverable ore to be reduced from 6.86 to 5.14 g/t Au, which is reflected in the lower reserves grade at year end (Table 2-9).

Mine development included a total drift advance of about 4500 m, with the main emphasis on preparation of the East Zone for production between the 87-m and 170-m levels, and extension of the ramp 80 m to the 250-m level. Production was from the Centre Zone above the 170-m level and from the East Zone above the 87-m level. Preparations were completed for deepening the mine shaft from its present depth of 370 m to a planned depth of 785 m by 1987.

Underground exploration was conducted on the 170-m level to evaluate the West Zone and from the 87-m level to evaluate a new zone to the east of the East Zone known as the L-19 Zone.

Lupin 1985

Mill throughput increased to 1556 tpd from 1347 tpd the previous year, resulting in a 7.5% increase in gold output (Table 2-9). Most production came from the 170-m level of the Centre Zone, with some from the 250-m and 170-m levels of the East Zone and the 87-m level of the West Zone. The ramp was extended from the 250-m level to the 330-m level. The shaft was deepened to 705 m and stations were cut at the 410-, 490-, 570- and 650-m levels. A drift was begun towards the Centre Zone on the 650-m level and drilling was completed into the West Zone from the three lowest levels. This development work is expected to substantially increase the reserves, which are presently calculated only to a depth of 400 m.

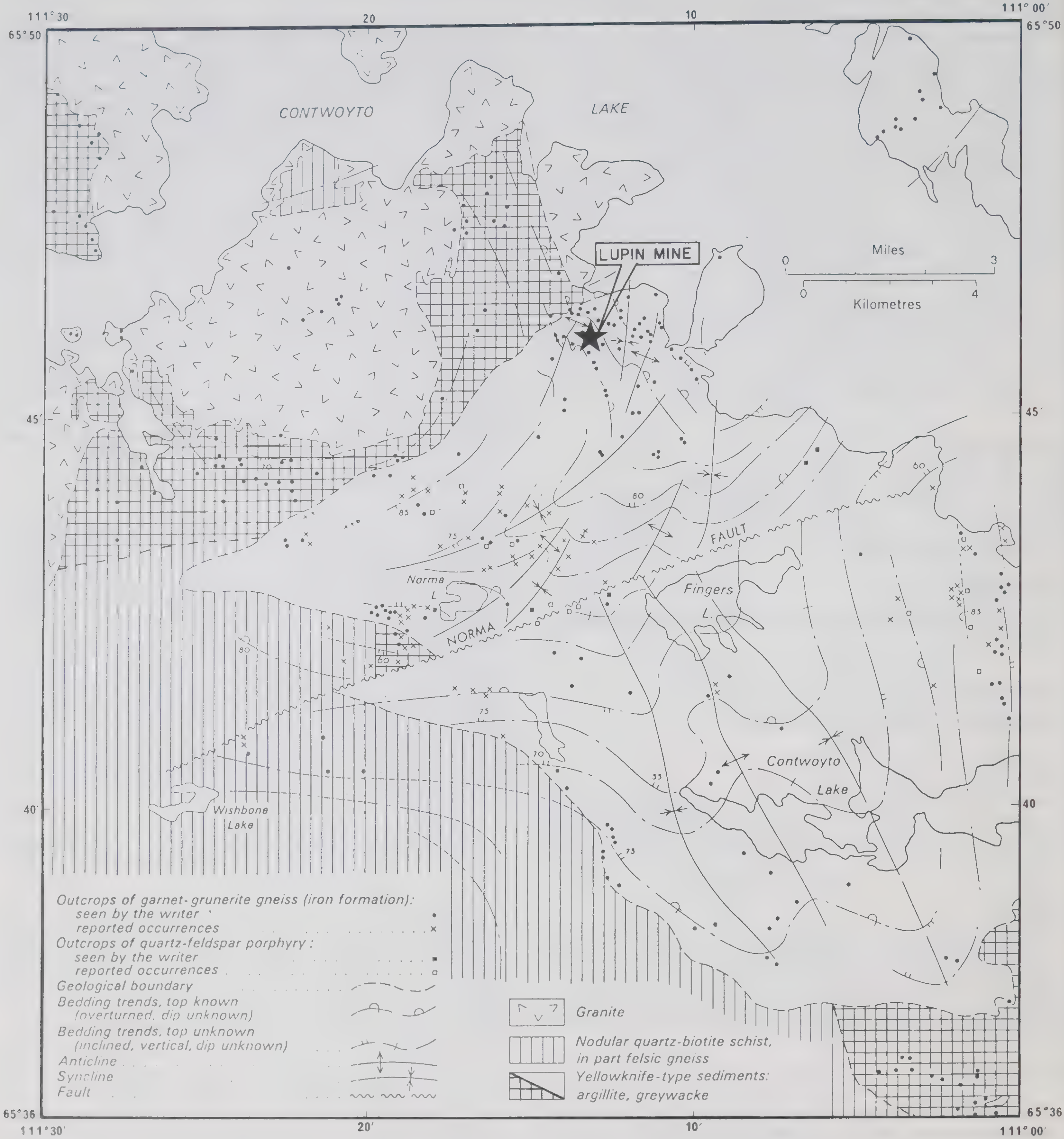

FIGURE 2-4: Regional geology of the Lupin Mine area. Contwoyto Formation argillite and greywacke metamorphosed to greenschist facies are shown in white; amphibolite-grade facies are cross-hatched. The Itchen Formation in the map area is metamorphosed to amphibolite facies and is distinguished from the Contwoyto Formation by the absence of iron-formation lenses. (modified from Tremblay, 1976)

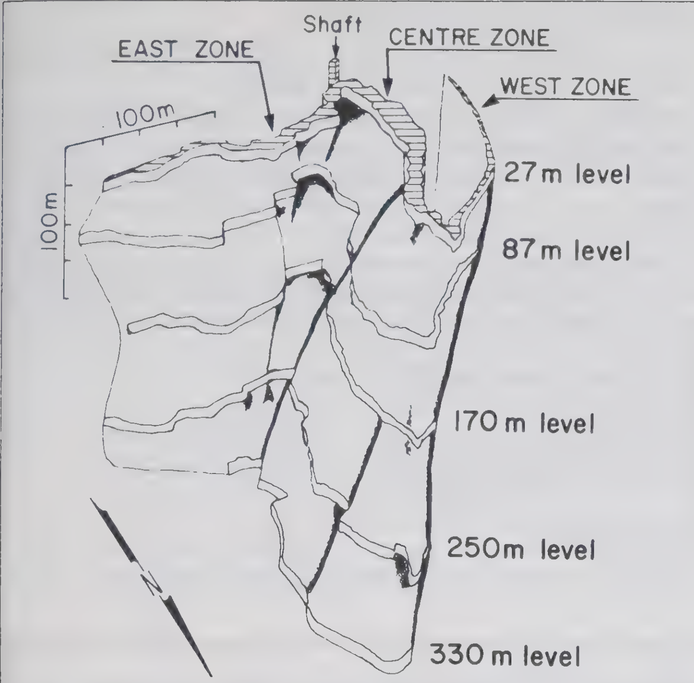

FIGURE 2-5: Isometric view of the Lupin orebody from the 27-m to the 330-m level (from Echo Bay Mines Ltd. Annual Report, 1982).

TABLE 2-9: PRODUCTION, RESERVES AND OPERATING COSTS, LUPIN, 1982-1985

Year	Milled	Output	Recovery	Reserves and Grade	Operating Cost/t
1982	199 Kt	1626 kg	—	3129 kt @ 13.6 g/t Au	—
1983	323 Kt	3758 kg	94.3%	3080 kt @ 13.6 g/t Au	$95
1984	491 Kt	5646 kg	95.2%	3141 kt @ 12.2 g/t Au	$72
1985	571 Kt	6069 kg	95.2%	2783 kt @ 11.7 g/t Au	$72

Source: Echo Bay Mines Ltd. Annual Reports, 1982-1985.

B-ZONE & SHEAR LAKE

Royex Gold Mining Corporation — Gold, silver
#1710 141 Adelaide St. W. — 65 G 1,7,8
Toronto, Ont., M5G 2G4 — 61°17'N, 98°31'W

REFERENCES

Brophy (1985); Laporte (1983); Page (1981).

PROPERTY

B-Zone: AIR 1-12; CEP claim; 13 DWE claims, GILT 1-15, 17-22, 25-29; SUE claim.
Shear Lake: MIK 3-5, 11-132.

LOCATION

B-Zone is about 840 km east-southeast of Yellowknife and 400 km north of Churchill, Manitoba. Shear Lake is about 5 km north of B-Zone. The mines are serviced by a 1500 m gravel airstrip.

HISTORY

Gold-bearing float was discovered in the vicinity of B-Zone by Selco Exploration Company Limited in 1961. Geophysical surveys and diamond drilling between 1961 and 1964 outlined several zones of auriferous iron formation, including the B-Zone. Some of the Selco properties lapsed and were restaked in 1972 by a consortium of companies (Royex Mining Ltd., Sturgex Mining Ltd. and Hewlet Mines Ltd.). O'Brien Gold Mines Ltd. purchased the Hewlet interest in 1973 and acquired additional claims from Selco. A decline was driven into the B-Zone in 1976 in accordance with the terms of an option agreement granted to Consolidated Durham Mines and Resources Ltd. In 1980, Cullaton Lake Gold Mines Ltd. was formed to develop and operate the mine, which came on stream the following year. Royex Gold Mining Corporation was amalgamated in December of 1980 and acquired total ownership of Cullaton Lake Gold Mines.

The Shear Lake Showing, several kilometers north of B-Zone (Fig. 2-6), was first staked in 1946 and was explored by Hudson Bay Mining and Smelting Ltd. and Selco Exploration Company Ltd. In 1973, the property was transferred to Royex Sturgex Mining Ltd. In 1982, Cullaton Lake Gold Mines Ltd. (wholly owned by Royex Gold Mining Corporation) agreed to a joint venture through which development costs and proceeds would be shared.

DESCRIPTION

B-Zone is underlain by Archean greywacke, argillite and banded iron formation of the Henik Group in the Churchill Structural Province (Fig. 2- 6). The sediments were metamorphosed to lower greenschist facies and deformed into north-trending overturned folds with west-dipping limbs during the Hudsonian orogeny. The B-Zone deposit is a 75 to 125 m thick and 250 m long segment of a discontinuous iron-formation unit that has been traced for 2400 m. The unit consists of four facies of iron formation; carbonate, oxide, silicate and sulphide. Gold is in the sulphide facies, which ranges in thickness from 0.6 to 17.4 m and occurs within or bordering the oxide (magnetite-rich) facies. The sulphide facies resembles that described previously for Lupin Mine, but is not as well layered. The sulphides at B-Zone include pyrrhotite, pyrite and minor arsenopyrite and chalcopyrite forming 5% to 20% of the rock. Gold grains are 3 to 10 μm wide and are within the non-metallic gangue minerals or along sulpide grain boundaries (Laporte, 1983). Page (1981) postulated a syngenetic-exhalative origin for B-Zone involving gold precipitation from hydrothermal fluids.

Several kilometers north of B-Zone, gently east-dipping, Aphebian clastics of the Hurwitz Group lie unconformably on Archean rocks of the Henik Group and host the Shear Lake deposit (Fig. 2-6). Gold is in a series of 1 to 2 m wide, easterly trending, vertical to steeply south-dipping shears cutting orthoquartzite near the base of the Hurwitz succession. The shears consist of quartz (or altered quartzite?) and more than 10% disseminated pyrite extensively altered to iron oxides above the 100-m level in the mine. The shears have been traced a maximum of 275 m along strike. Little has been written about the origin of the Shear Lake deposit, although the presence of stratiform gold deposits in the Hurwitz Group prompted Brophy (1985) to suggest that gold may have been remobilized into the shears from paleoplacers.

TABLE 2-10: PRODUCTION AND RESERVES, B-ZONE AND SHEAR LAKE, 1981-1985

Year	Milled B-Zone	Output B-Zone	Reserves B-Zone	Milled Shear Lk	Output Shear Lk
1981	9 kt	14 kg	278 kt @ 25 g/t Au	—	—
1982	66 kt	695 kg	150 kt @ 17.0 g/t Au		
1983	102 kt	1147 kg	154.2 kg @ 17.14 g/t Au		
1984	52 kt	450 kg	?	87.2 kt	423 kg
1985	—	—	—	82.1 kt	407 kg

Source: Data mainly from Mining Inspections Service of the Government of the NWT. The reserves grade at B-Zone in 1981 was apparently overestimated. Geological reserves at Shear Lake are 1.5 Mt grading 7.9 g/t Au (personal communication, mine geologist)

CURRENT WORK AND RESULTS

A summary of production and reserves at B-Zone and Shear Lake since startup is given in Table 2-10.

In 1984, underground development at Shear Lake was accelerated as lower gold prices began to make mining at B-Zone unprofitable. By mid-year, operations had shifted entirely to Shear Lake. The price of gold continued to decline in 1985. By August of that year, operations at Shear Lake also proved unprofitable and the mine was forced to close. At that time, the ramp had been advanced to the 150-m level to exploit three main gold-bearing shears known as the 18, 19 and 21 veins.

SILVER BEAR MINE

Terra Mines Ltd.
202, 7608-103 St.
Edmonton, Alta., T6E 4Z8

Silver
86 E/9
65°36'N, 117°57'W

REFERENCES

Badham (1975); Brophy (1985); Hildebrand (1981b, 1983).

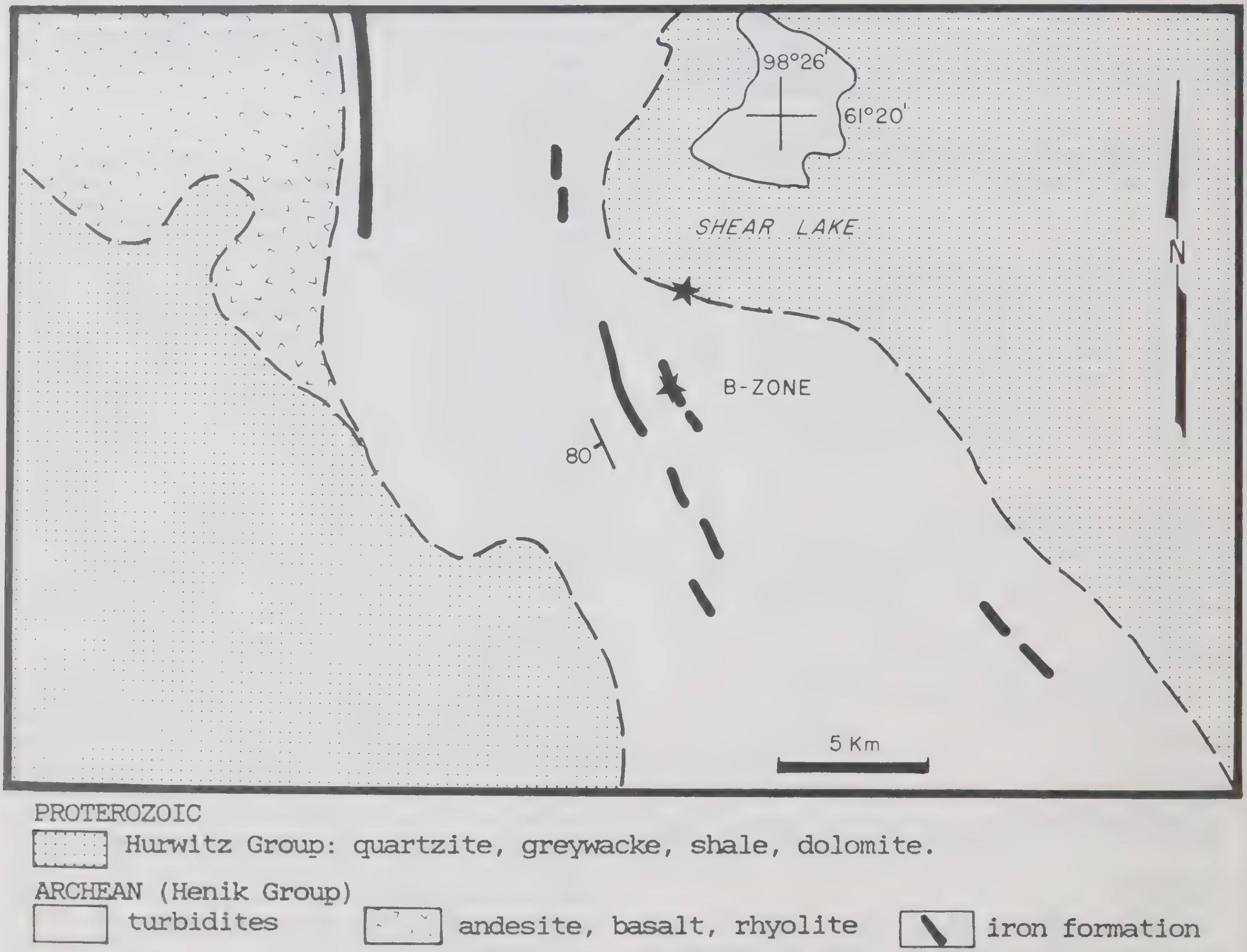

FIGURE 2-6: Simplified geology of the Cullaton Lake area showing the positions of the B-Zone and Shear Lake orebodies (from Page, 1981).

PROPERTY

Nine A claims.

LOCATION

Silver Bear is 405 km north-northwest of Yellowknife and is serviced by a gravel airstrip.

HISTORY

The Silver Bear Mine is on property staked in the forties as the YAW group and drilled in the sixties by Eldorado Mining and Refining Limited and Echo Bay Mines Limited. The ground was restaked as the A group in 1966 and acquired by Silver Bear Mines Limited, the assets of which were taken over by Terra Mines Limited the following year. Mining commenced at Silver Bear in 1969 after considerable underground development and completion of a 270 tpd mill capable of producing separate silver-bismuth and copper-silver concentrates. Terra's other silver mines in the area (Norex, North & Smallwood; Brophy, 1985) did not operate in 1984 or 1985.

DESCRIPTION

The Silver Bear Mine is on the southwest limb of the Norex Syncline near the north boundary of the Rainy Lake Intrusion (Fig. 2-7). It is hosted in the Terra Formation (formerly the Arden Formation of Hildebrand, 1981b), which consists of an upper member comprising lithic arkose, calc-argillite, conglomerate, siltstone and mudstone, and a lower member comprising mudstone, breccia, cherty tuff, lapilli tuff, siltstone and limy mudstone. Most ore is in the upper member, which in the mine area contains more than 10% banded and disseminated sulphides; mainly pyrite, pyrrhotite and chalcopyrite, but also cobalt-bismuth arsenides, native silver, argentite and native bismuth. Ore is concentrated in steeply to moderately south-dipping, northeast-striking, quartz-carbonate-hematite vein systems that cut the banded sulphides. Ore-bearing veins have also been mined in fractures in the Rainy Lake Intrusion, an epizonal syenite pluton to the south. The veins, which are considered magmatic-hydrothermal in origin (Badham, 1975), consist of silver-bearing pods surrounded by a thin halo of silicic, hematitic, chloritic and carbonate alteration.

CURRENT WORK AND RESULTS

Declining silver prices forced Terra to operate the mill in a cut-back mode throughout most of 1984. Production from Silver Bear was obtained from several vein structures related to high-grade silver areas which were previously mined, thereby reducing development costs. Effective April 1, 1985, production at Silver Bear was suspended pending an improvement in silver prices. Production from Terra's silver mines in the area (Silver Bear, Norex and Smallwood) during the past decade is summarized in Table 2-11.

TABLE 2-11: PRODUCTION; SILVER BEAR, NOREX AND SMALLWOOD, 1976-1985

Year	Kt Mined	Ag Output
1976	41.5	58000 kg
1977	33.2	45900 kg
1978	33.6	46000 kg
1979	26.9	13700 kg
1980	27.9	9700 kg
1981	?	1800 kg
1982	36.6	26717 kg
1983	72.2	46654 kg
1984	21.1	24620 kg
1985	5.8	6746 kg

** Source: Annual reports and Mining Inspection Service of the Government of the NWT.*

PINE POINT MINE

Pine Point Mines Ltd.	Zinc, Lead
Pine Point, NWT	85 B/15, 16
XOE OWO	N-42 deposit at:
	60°50′50″N, 114°27′12″W

REFERENCES

Campbell (1967); Gibbins (1983); Jackson and Beales (1967); Kyle (1980); Macqueen and Powell (1983); Rhodes (1981); Skall (1975).

PROPERTY

4,476 leased claims as follows:

LEASE	LOT	GROUP	CLAIMS
2828			24
2851			
2878			994
2278	129	864	26
2280	130	864	32
2328	131	864	1
2329	575	814	816
2418	587	814	49
2419	601	814	30
2519	586	814	50
2553	646	814	68
2599	656	814	2
2600	657	814	5
2638	652	814	2
2639	588	814	124
2640	138	864	54
2641	139	864	22
2645	141	864	41
2646	142	864	19
2647	146	864	1
2648	147	864	1
2649	645	814	138
2650	600	814	8
2651	638	814	1
2652	649	814	8
2653	149	864	1
2654	150	864	3
2656	140	864	44
2657	594.1	814	97
2678	644	814	86
2679	653	814	72
2680	594.2	814	11
2681	151	864	2

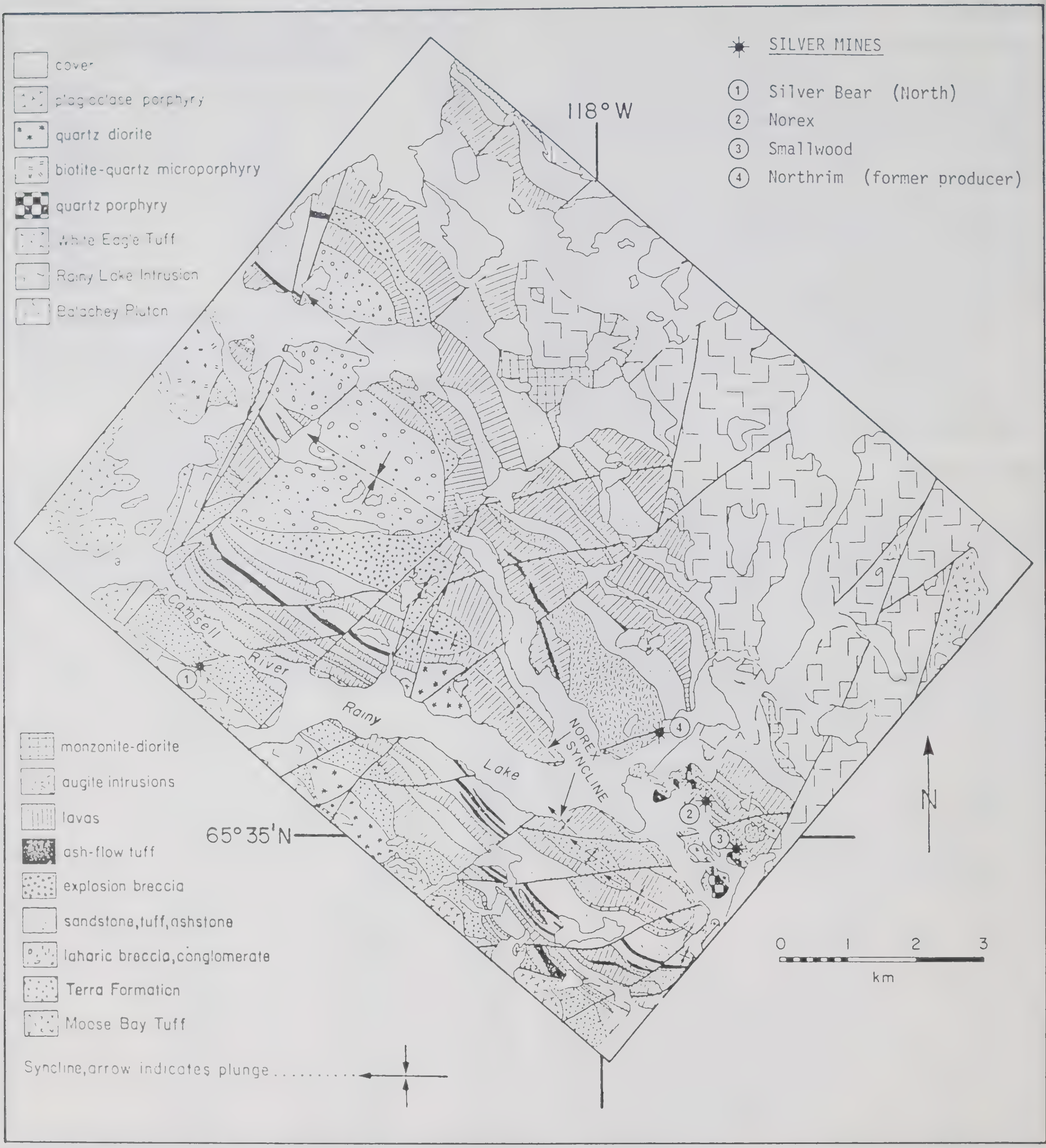

FIGURE 2-7: Regional geology of the Camsell River area showing silver mines and the complex facies relations between various rock types in the Camsell River Formation (from Hildebrand, 1983).

LEASE	LOT	GROUP	CLAIMS
2682	145	864	35
2683	659	814	77
2706	662	814	94
2790	665	814	15
2431	143	864	50
2432	640	814	111
2433	641	814	57
2330	137.3	864	27
2331	137.1	864	16
2279	137.2	864	115
2689	148	864	124
2776	639	814	6
2870	693	814	18
2871	694	814	12
2872	695	814	18
2892	698	814	754
2956	697	814	1
2957	697	814	115

LOCATION

The claims form a block 53 km long and several kilometers wide on the south shore of Great Slave Lake, 120 km south of Yellowknife. A highway connects Pine Point to Hay River and a 1,370 m gravel airstrip is situated near the mill. A spur line of the Great Slave Railway provides concentrate and freight transport.

HISTORY

Prospectors on their way to the Klondike goldfields were directed to sulfide outcrops near Pine Point by natives in 1898. Some claims were staked, but were allowed to lapse because only minor amounts of gold and silver were found. The area was examined again during the twenties, and in 1929 Northern Lead Zinc Company, formed with financing from Ventures Ltd. and Cominco, began a program that lasted two decades and included pitting and drilling. In 1948, a three-year concession of exclusive prospecting rights to 1295 km² was granted to these companies. Over 1000 claims were staked when the concession expired and a new company, Pine Point Mines Ltd. was formed to finance continuing work. Majority interest in Pine Point Mines Ltd. is held by Cominco. Construction of a government-financed, 677 km long railway from Roma, Alberta to Pine Point began in 1962. First ore from Pine Point was high-grade and was shipped in 1965, just prior to the completion of the mill. Reserves were bolstered by the acquisition of deposits from Pyramid Mining Co. in 1966 (X-15 and W-17 deposits), Coronet Mines Ltd. in 1972 (R-61 and S-65 deposits) and Conwest-Newconex Canadian Exploration in 1974 (A-55 deposit). The most recent exploration highlight was the 1981 discovery of the N-81 orebody (Fig. 2-8), which is the third largest orebody found on the Pine Point property at 2.7 Mt grading 21% combined lead-zinc. All production, except for underground test mining of the M-40 deposit, has been from open pits.

DESCRIPTION

About 50 zinc-lead deposits (Fig. 2-8) have been found on the property within carbonates of the Pine Point Group (Fig. 2-9), a Middle Devonian (Givetian) barrier reef complex that separates deep-water carbonate and shale of the Mackenzie Basin to the north from back-reef evaporite deposits of the Elk Point Basin to the south (Kyle, 1980).

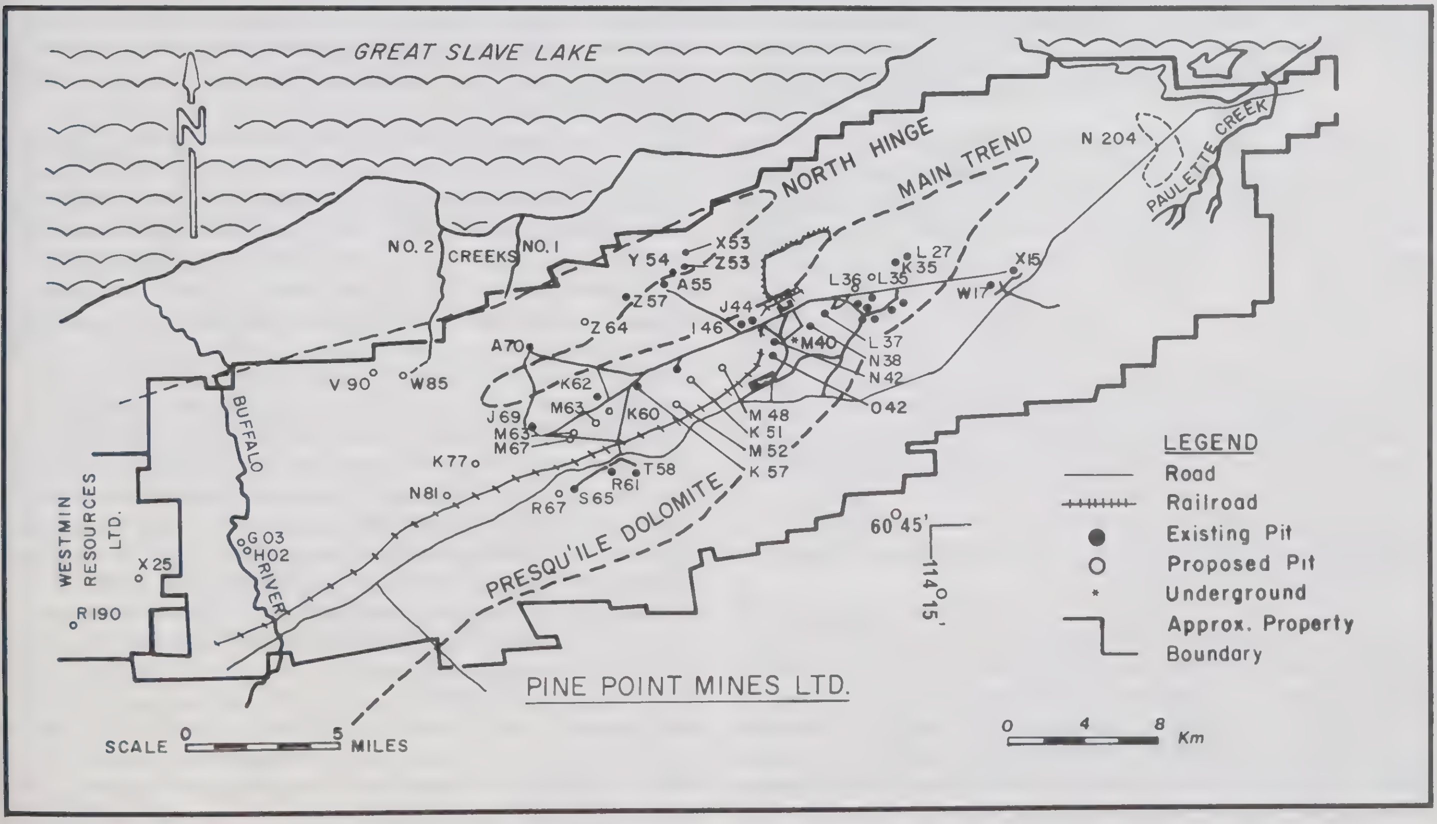

FIGURE 2-8: Deposits, Pine Point property (from Gibbins, 1983).

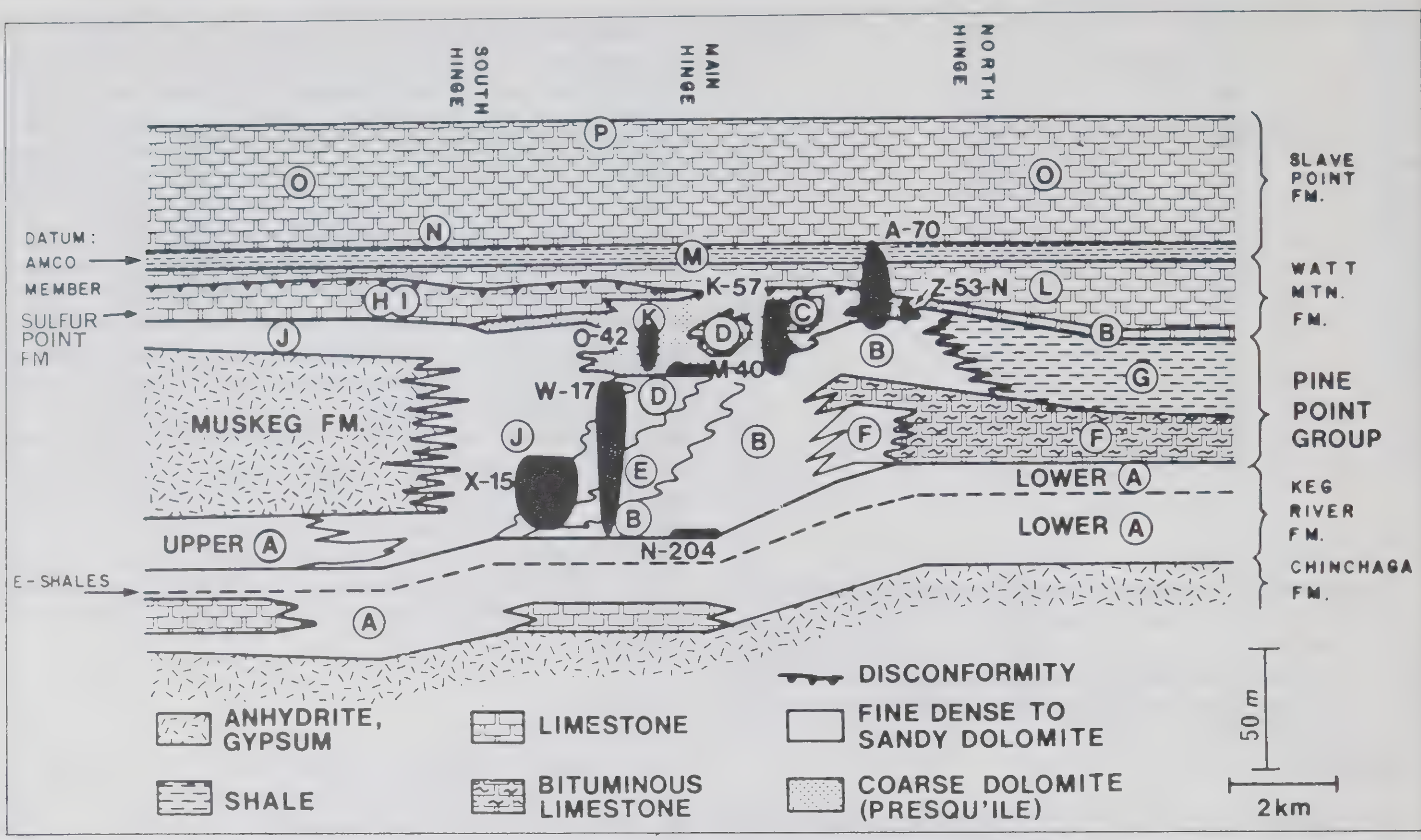

FIGURE 2-9: Schematic west-facing, southeast-northwest section across the Presqu'ile barrier complex on the Pine Point Property, showing facies A through P and approximate locations of the major ore bodies as projected a single cross section. Highly generalized and modified from Kyle (1980); original facies designations environmental interpretations from Skall (1975). A-Keg River Formation; dolomite, variably argillaceous (marine platform). B through K-Pine Point Group. B-argillaceous dolomite (off-reef facies); C-micritic limestone (shallow fore-reef facies); D-sucrosic Dolomite, skeletal limestone (organic barrier facies); E-sucrosic dolomite (clean arenite facies); F-micritic, bituminous limestone (deep marine basinal facies); G-calcareous shale (Buffalo River Facies); H and I-micritic limestone (gastropod and Amphipora facies); J-sucrosic dolomite (back-reef facies); K-coarsely crystalline dolomite (Presqu-ile facies); L-Watt Mountain Formation, micritic limestone (green shaly facies); M through P-Slave Point Formation; M-limestone and shale (Amco Member); N-micritic limestone (tidal flat member); O-intraclastic limestone (shallow platform member); P-micritic limestone (deep platform member); (from Macqueen and Powell, 1983).

Pine Point sulfide bodies range in size from less than 100 kt to as much as 14 Mt and occur at several stratigraphic positions in a 200 m section of the barrier complex (Fig. 2-9). Average metal content of the ore is about 5.8% zinc and 2.2% lead. The main gangue components are iron sulfides and carbonate.

Skall (1975) subdivided the Pine Point Group and adjacent formations into a number of ecological facies (Fig. 2-9) and showed that subtle tectonic adjustments along three hinge zones trending 065º were responsible for development of these facies. The North and Main Hinges (Fig. 2-8) coincide respectively with the southern limit of marine Facies G and the northernmost extension of a depositional tongue of Facies J. The South Hinge coincides with the northernmost evaporites of the Muskeg Formation. Most of the Pine Point orebodies are within the North and Main Hinges.

Karstification, a process that is considered important in preparing the host rock for mineralization (Beales and Jackson, 1968), is particularly evident below the erosional disconformity at the top of Sulfur Point Formation (Fig. 2-9). Many of the Pine Point orebodies (eg. M-40, O-42 and K-57 deposits) are at or near the base of the Sulfur Point Formation in karsted carbonate that has been altered to coarse-crystalline dolostone (Presqu'ile or K Facies of Fig. 2-9).

Two principle types of orebodies are present at Pine Point, tabular and prismatic (Rhodes, 1981). Tabular deposits are elongate, flat-lying orebodies associated with an interconnected network of karst channels mainly confined to the base of the Sulfur Point Formation along the North and Main hinges (eg. M-40 deposit of Fig. 2-9). Prismatic deposits are vertically elongate ore-bodies that formed when further dissolution in tabular karst zones caused sagging, foundering and collapse of the overlying strata. Prismatic ore bodies (eg. K-57 and O-42 deposits of Fig. 2-9) typically contain about 1 Mt or ore.

Some Pine Point orebodies are well below the base of the Sulfur Point Formation (eg. X-15 and W-17 deposits of Fig. 2-9) and are thought to have formed because continuing dissolution below tabular or prismatic orebodies allowed them to collapse into underlying strata (Rhodes, 1981). One of the largest deposits on the Pine Point property is N-81 (Fig. 2- 8), a collapsed prismatic orebody that was discovered in 1981.

The origin of the ore deposits at Pine Point is a subject of debate. Campbell (1967) suggested that mineralization was from thermal waters arising along the MacDonald-Hay River fault systems that underlie the Pine Point ore trend. Jackson and Beales (1967) identify the Pine Point orebodies as Mississippi Valley-type deposits and regard a genetic relation of the orebodies to basement faults as unwarranted. They postulated that mineralization was a result of normal evolution in a sedimentary basin. Metals were released by weather-

TABLE 2-12: PRODUCTION AND RESERVES, PINE POINT, 1976-1986

	PRODUCTION			RESERVES		
Year	Milled	Kt Zn	Kt Pb	Mt	grade Zn	grade Pb
1976	3.42 Mt	170	54	32.7	5.4%	2.0%
1977	3.12 Mt	156	61	33.6	5.3%	2.1%
1978	2.98 Mt	162	74	33.6	5.1%	1.9%
1979	2.99 Mt	151	54	34.5	5.0%	1.9%
1980	3.29 Mt	171	62	37.2	5.3%	1.9%
1981	3.30 Mt	148	64	37.2	5.4%	2.4%
1982	2.22 Mt	153	64	31.7	6.1%	2.7%
1983	0.89 Mt	68	23	23.6	6.3%	2.7%
1984	2.28 Mt	163	51	21.8	6.0%	2.7%
1985	2.14 Mt	166	62	14.5	6.7%	2.7%

Sources: Pine Point Mines Ltd annual reports.

TABLE 2-13: DEVELOPMENT, PINE POINT, 1983-1985

Year	Waste and Overburden Removal	Cost/t Milled	Strip Ratio	Exploration $ × 10⁶	Line-km IP Surveys	Expl'n Drilling	Def'n Drilling
1983	12.7 Mt	$28	12.7	2.4	97	35,052 m	16,154 m
1984	25.6 Mt	$27	12.4	3.7	349	49,072 m	48,158 m
1985	24.8 Mt	$31	NR	4.3	NR	NR	NR

NR = not reported
Source: Pine Point Mines annual reports, 1983-1985.

ing of continental rocks and were deposited with basinal shales as absorbed metal ions on clay minerals. Metals were released as soluble metal chloride and organic complexes during compaction and diagenesis. Metal-bearing brines migrated laterally into the permeable reef complex, travelling in the direction of lower hydraulic head. Reduction of sulphate derived from evaporitic strata in the Elk Point Basin, to the south of the Pine Point Barrier Reef, resulted in concentration of hydrogen sulphide in more permeable zones of the carbonate complex. Mixing of metal-bearing brines with reduced sulfur caused precipitation of metal sulfides.

CURRENT WORK AND RESULTS

A ten-year summary of production and reserves at Pine Point is given in Table 2-12.

Development at Pine Point between 1983 and 1985 is summarized in Table 2-13.

Pine Point 1984

In its 20th anniversary of production, Pine Point returned to profitability after two years of losses. This turnaround was due to higher lead-zinc prices and improved productivity. Mine production came from 7 pits on the North Hinge as well as from the N-81 prismatic ore body on the Main Trend (Fig. 2-8), which came on stream in July. Exploration was carried out mainly along the Main Trend west of the N-81 deposit. One prismatic orebody containing 203 kt grading 8.1% Zn and 3.9% Pb was discovered 11.3 km west of the concentrator. Exploration in the western part of the North Hinge, where mineralized rocks are 90 m below the surface, has shown signs of tabular ore zones of sufficient size and grade to warrant mining by underground methods. To test the feasibility of mining this ore, a $2 million underground mining program was started in the third quarter. By year-end, a decline from a pit wall had been advanced 320 m towards the underground orebody.

Pine Point 1985

Pine Point was unprofitable in 1985 because of declining zinc-lead prices and higher costs (Table 2-13) incurred to dewater deeper pits and remove overburden from deeper ore bodies. Late in the year, production plans for 1986 and 1987 were announced that will reduce operating costs by increasing production rates from the best ore sources available, reducing the strip ratio and running the mill at full capacity. The revised plans involve processing 4.54 Mt of ore that are estimated to be economic even at the present depressed metal prices. Another 9.8 Mt of reserves could be mined profitably if metal prices improve. About 7 Mt of previously ore-grade material that now cannot be profitably mined were removed from the reserves. Given present metal prices, it is uncertain whether operations at Pine Point can be sustained beyond 1987.

Production in 1985 came principally from the N-81 orebody and three pits on the North Hinge, with a small amount of high-grade ore from the underground mine. During the third quarter, a decision was made to accelerate underground operations to maximize the output of high-grade ore. To reduce the growing impact of dewatering costs, a plan was formulated to construct an impervious barrier around the N-81 pit by injecting grout into the surrounding rock through surface boreholes. This project was abandoned when contractors failed to complete the job by the end of the construction season. Exploration in 1985 succeeded in adding nearly 1.8 Mt of ore grading 9.1% and 4.6% Pb to reserves. Most of this ore is in two tabular deposits (Z-60 and X-49) and an underground deposit (X-71) on the North Hinge, and in a prismatic deposit (P-24) on the east Main Trend. P-24, scheduled for development in 1986, is a shallow deposit containing 454 kt grading 7.6% Zn and 3.7% Pb.

NANISIVIK MINE

Nanisivik Mines Ltd.	Zinc, lead, silver
12th Floor,	48 C/1
20 Toronto St.	73º02'30''N, 84º28'30''W
Toronto, Ont., M5C 2B8	

REFERENCES

Blackadar (1956, 1970); Brophy (1985); Clayton and Thorpe (1982); Jackson and Iannelli (1981); Lemon and Blackadar (1963); Olson (1984).

PROPERTY

A claim, FISH 1-12, HB claim, 22 LION claims, LYNK 1-4.

LOCATION

The Nanisivik Mine is south of Strathcona Sound on Borden Peninsula, northwestern Baffin Island. It is 27 km east of the community of Arctic Bay and is serviced twice a week by commercial jet flights from Montreal, 2000 km to the south. A marine wharf, just north of the mill on Strathcona Sound, accommodates ocean-going ships that carry concentrates to smelters during the short shipping season.

HISTORY

Sulphides at Strathcona Sound were first observed by a Dominion Government Expedition in 1910. Some claims staked by prospectors in 1937 were allowed to lapse, but it was not until Blackadar (1956) reported on extensive base-metal-bearing pyrite zones that Texas Gulf Sulfur Co. Ltd. (TGS) began to investigate the area in earnest. In 1957, fifteen claims were staked to partly cover what proved to be the eastern end of the Main Orebody (Fig. 2-10).

In 1972, an option on the Strathcona Sound property was negotiated with Mineral Resources International. Watts, Griffis and McOuat Ltd., commissioned to do a feasibility study, recommended that the property be brought to production. Financing was arranged through agreements with TGS (now Kidd Creek Mines), Metallgesellschaft AG, Billiton BV and various banks. A development agreement was negotiated whereby the Government of Canada would obtain an 18% interest in the project for supplying infrastructure. In 1974, Strathcona Mineral Services was contracted to manage the project and Nanisivik Mines Ltd. was formed to operate the mine. Production began in 1976 at a rate of 1,420 tpd. Preproduction costs, excluding property acquisition and exploration, amounted to about $51 million.

DESCRIPTION

The Nanisivik mine area on Borden Peninsula is underlain mainly by dolomite of the Society Cliffs Formation, the lowermost unit of the Neohelikian Uluksan Group, and locally by conformably overlying shales of the Victor Bay Formation (Lemon and Blackadar, 1963; Blackadar, 1970, Jackson and Iannelli, 1981; see Fig. 2-11). The Neohelikian strata are cut by Hadrynian diabase dikes, at least one of which is known to cut an orebody, thus establishing a pre-Hadrynian age for mineralization. Regionally, Nanisivik lies on a major west-northwest-trending graben, the long axis of which underlies and parallels Strathcona Sound (Clayton and Thorpe, 1982). The orebodies are in an area where subsidiary horsts and grabens have been superposed on this major structure. The strata in the mine area, where relatively undisturbed by faulting, strike easterly and dip gently to the north.

The ore bodies at Nanisivik are in the Society Cliffs Formation, which comprises slightly metamorphosed, algal laminated, brown-weathering, light grey to black dolostone that commonly emits a petroliferous odour when broken and contains sparsely disseminated blebs of bituminous material (Jackson and Iannelli, 1981).

Production from Nanisivik has been principally from the Main Orebody (Fig. 2-10) which comprises a main upper lens connected by subvertical sulphide keel zones to a number of smaller and less continuous lower lenses. The Main Lens, a tabular, horizontal ore body that extends sinuously for 3 km, is about 100 m wide and from 2 to 30 m thick. Typical ore consists of euhedral to subhedral sphalerite and galena with anhedral pyrite, sparry dolomite and ice as gangue. Flat layering in much of the Main Orebody is at a slight angle to the gently inclined beds of the hosting carbonates.

In addition to the Main Orebody, four other ore zones and a number of massive pyrite zones have been identified in the mine area (Fig. 2-11). Olson (1984) considers the orebodies to be Mississippi Valley-type (MVT) deposits, although the age, geological setting, and high silver and iron contents of the Nanisivik orebodies are atypical of MVT deposits (Brophy, 1985).

CURRENT WORK AND RESULTS

A summary of production and reserves at Nanisivik from 1977 to 1985 is given in Table 2-14.

Nanisivik 1984

During 1984, Mineral Resources International (MRI) increased its interest in Nanisivik Mines to 70.75% by purchasing the 6.5% interest held by Kidd Creek Mines and the 11.25% interest held by Metallgesellschaft Canada Ltd. The remaining interest is held by the Government of Canada (18%) and Billiton Canada Ltd. (11.25%).

During the year a number of areas were mined. Work in the Main Lens was concentrated on the east end of the deposit as part of a long-term plan to mine from east to west and allow pillar recovery to commence in the near future. Mineralized zones beneath the Main Lens continue to be developed, but ore continuity is inconsistent and does not allow a high rate of mining from this area. Mining of the Area-14 satellite orebody (Fig. 2-10) commenced during the year; about half of the original reserves, 200 kt of good-grade ore, were mined.

Modest additions were made to ore reserves around the periphery of the Main Orebody, but the potential for further significant additions here is considered limited.

The Shale Hill deposit (Fig. 2-10), which contains 200 kt of good-grade ore, will be mined in the future. The Ocean View

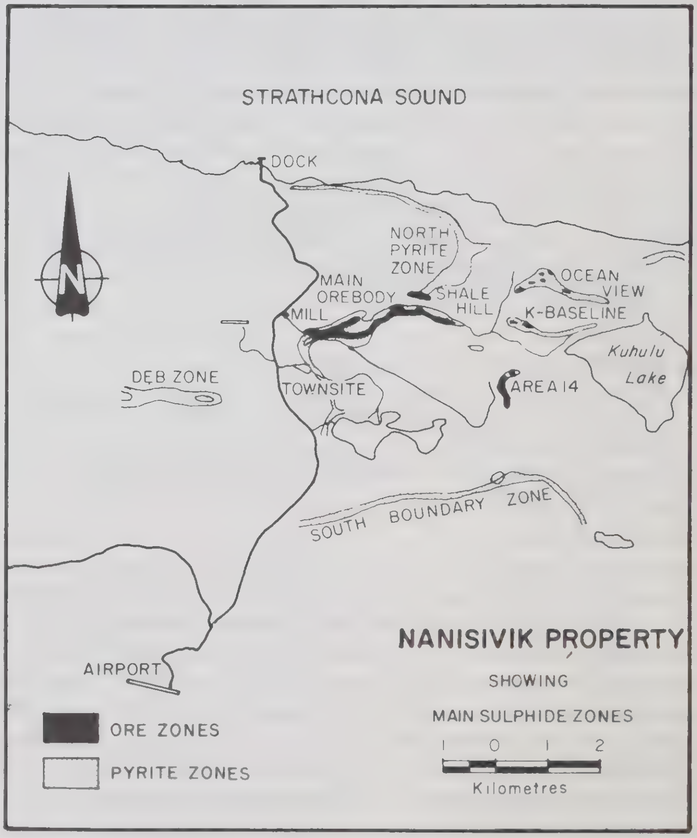

FIGURE 2-10: Main sulphide zone at Nanisivik (from Mineral Resources International Annual Report, 1985).

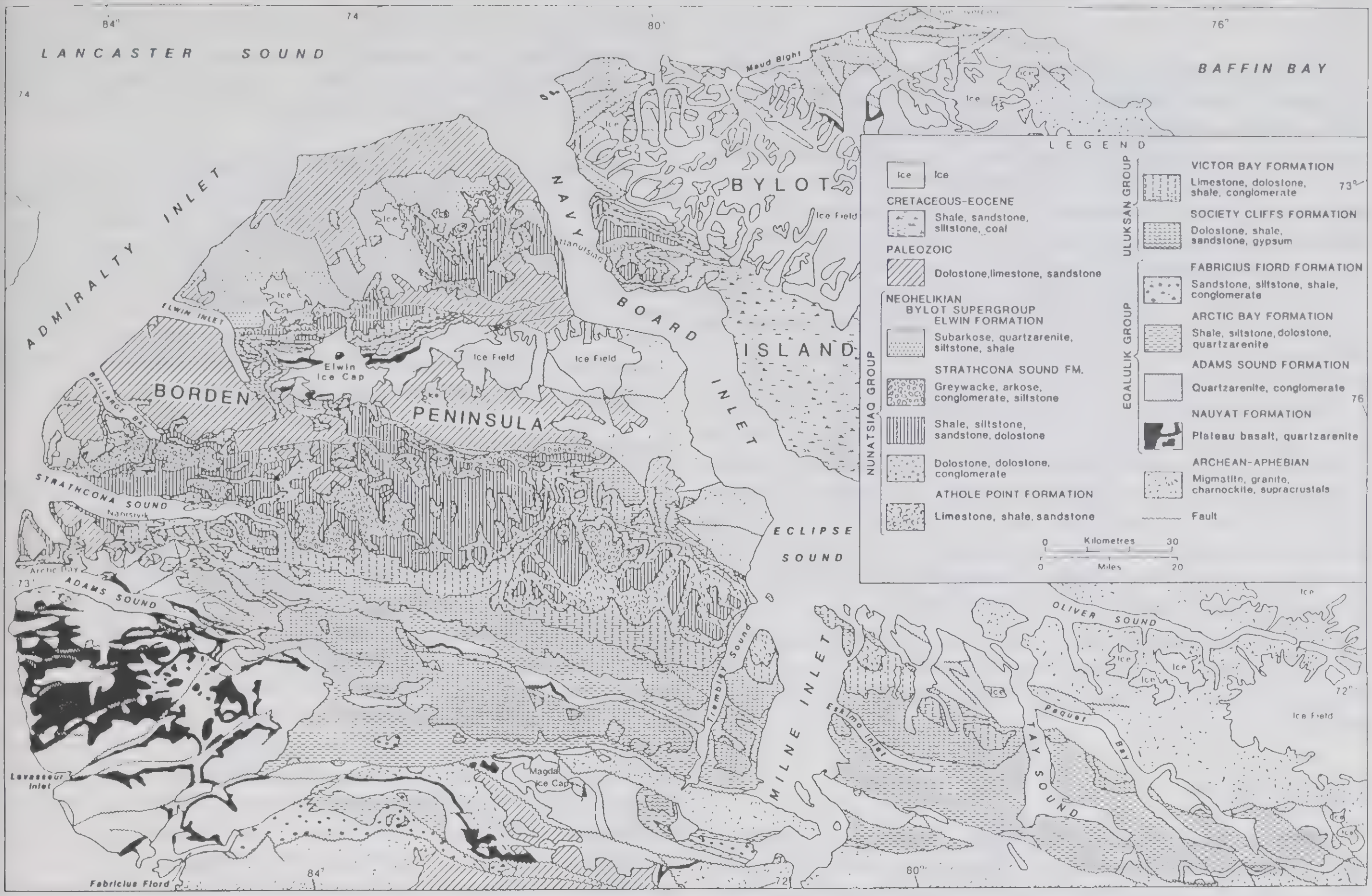

FIGURE 2-11: Regional geology, Borden Basin. Nanisivik is shown south of Strathcona Sound at about 73°N latitude and 85°W longtitude (from Jackson and Iannelli, 1981).

TABLE 2-14: PRODUCTION AND RESERVES, NANISIVIK, 1977-1985

PRODUCTION				RESERVES		
Year	kt milled	kt Zn	kt Pb	kt	% Zn	% Pb
1977	525	68	10.8	6350	13.2	1.4
1978	575	73	7.2	5300	11.6	1.3
1979	615	76	7.6	3250	11.9	1.2
1980	435	64	10.3	3250	12.0	1.1
1981	624	68	8.3	3580	10.3	0.8
1982	622	75	9.4	4400	11.0	1.5
1983	628	61	6.4	3800	10.0	0.8
1984	693	68	7.0	3150	9.5	0.5
1985	693	61	5.1	*2460	9.5	0.5

Sources: thoughput and base-metal ouput from Mining Inspection Service of the Government of the NWT. Reserves and grade from Mineral Resources International annual reports.
Note: Nanisivik ore also contains about 40-50 g/t silver.
**Note: 1985 reserves are estimated.*

deposits (Fig. 2-10), which contain 200 kt grading 6% Zn, may be mined if zinc prices improve.

Nanisivik 1985

Nanisivik reduced zinc production by not shipping about 15,000 t of available zinc concentrate and by mining lower-grade ore in the latter part of the year. This strategy of curtailing production during times of low zinc prices is possible because Nanisivik is relatively debt free.

POLARIS MINE

Cominco Ltd.	Zinc, Lead
Northern Group	68 H/8
Precambrian Building	Deposit at:
Yellowknife, NWT	75º23′42″N, 96º56′00″W

REFERENCES

Kerr (1977a, 1977b); Muraro (1973); Scales (1982).

PROPERTY

POLARIS 1-21.

LOCATION

The Polaris Mine is at the southwest extremity of Little Cornwallis Island, 1700 km north-northeast of Yellowknife and 100 km north-northwest of Resolute on Cornwallis Island. Supplies and personnel are flown to an airstrip at the mine site from Resolute, which is regularly serviced by commercial flights from Montreal (Nordair) and Yellowknife (Pacific Western Airlines). A wharf on Crozier Strait at the mine site accommodates ocean-going ships that carry nonperishable supplies to the mine and concentrates to smelters.

HISTORY

Geologists mapping oil permits for Bankeno Mines Ltd. discovered galena and sphalerite on Little Cornwallis Island in 1960. Between 1961 and 1963, Bankeno drilled and staked ground covering the Polaris deposit. The claims were optioned to Cominco in 1964, and geological mapping, surface diamond drilling and geochemical surveying were carried out between 1964 and 1966. A geophysical survey in 1970 detected a coincident gravity and IP anomaly. The anomaly was drilled in 1971, and 16 Mt of ore grading 20% combined lead-zinc was outlined. A new company, Arvik Mines Ltd., was formed to develop the Little Cornwallis properties. Encouraging results from further drilling in 1972 led to underground development in 1972-73 to obtain a bulk sample and to confirm continuity of the orebody and viability of mining in permafrost. Extensive underground drilling established reserves estimated at 23.0 Mt grading 14.1% Zn and 4.3% Pb. After feasibility studies in 1979, Cominco and Bankeno decided to dissolve Arvik Mines and bring the Polaris deposit to production. The orebody was turned over to Cominco under an agreement in which Bankeno Mines retains an option on a royalty interest.

In 1981, the mill and office complex, which was constructed at Trois Riveres in Quebec, was erected on a barge and floated to the mine site. First ore was fed into the mill on November 4, 1981.

DESCRIPTION

Polaris is one of many Mississippi Valley-type lead-zinc deposits in the Cornwallis Pb-Zn District (Fig. 2-12), which corresponds to the northernmost part of the Cornwallis Fold Belt, a north-trending, north-plunging anticlinorium, extending more than 650 km from the Precambrian Shield to the Sverdrup Basin (Kerr, 1977a). The fold belt was formed in response to four main pulses of differential vertical uplift during the Silurian and Devonian. The Ordovician Thumb Mountain Formation, which comprises limestone and minor dolomite and hosts all of the significant Pb-Zn deposits in the Cornwallis District, was subjected to erosion and karstification during the third pulse of uplift in early Devonian time (Kerr, 1977a). The deposits are stratabound, hosted in brecciated dolostone (rather than the usual limestone of the Thumb Mountain Formation) and are close to shale of the overlying Cape Phillips Formation (Fig. 2-13), which may have been the source for metals (Kerr, 1977b).

The Polaris deposit is on the western limb of a broad, north-trending syncline and is in the upper approximately 75 m of dolomitized Thumb Mountain Formation carbonates. The Thumb Mountain Formation is about 520 m thick at Polaris and the upper mineralized zone is characterized by abundant thin-shelled fossil debris. The Thumb Mountain Formation is overlain successively by about 61 m of nodular limestone and green shale of the Irene Bay Formation and by dark-coloured silty calcareous shale of the Cape Phillips Formation, which is only partly preserved beneath an unconformity (Fig. 2-13). Strata strike north-northwesterly and dip 8º to 15º east. The Polaris deposit is about 350 m long in a northwesterly direction and about 150 m wide. In cross-section (Fig. 2-14), the deposit is pan-shaped and comprises the upper Panhandle Zone, about 5 to 40 m thick and beginning about 100 m below surface (50 m below sea level), and the lower Keel Zone, about 100 m thick and beginning about 200 m below surface (125 m below sea level). The Panhandle Zone contains about 4 Mt of ore and the Keel Zone about 21 Mt. Ore grade is about 14% Zn and 4% Pb (Cominco public information circular, "Welcome to Polaris").

Sulfides in the Polaris deposit include sphalerite, galena and about 5-10% pyrite or marcasite. Sphalerite is colloform except where it has crystallized to partly fill vugs in massive sections of sulfide. Galena is medium to coarse grained; iron sulfides are mainly fine grained (Muraro, 1973). The entire ore body is estimated to have a porosity of about 5% (Scales, 1982). Voids are filled with fresh-water ice, so the deposit must be exploited by dry mining techniques at sub-zero temperatures to prevent deterioration of ground conditions.

CURRENT WORK AND RESULTS

A summary of production and reserves at Polaris since startup is given in Table 2-15.

Much of the production in 1984 was from primary stopes in the Panhandle Zone, but by March of 1985 the primary stopes were mined out and production in the Panhandle Zone was from the recovery of pillars. In January of 1985, mining operations moved into the southern part of the Keel Zone, which supplied 90% of the mill feed in 1985 and is now (Apr. 1986) developed down to the 760-m level (Fig. 2-14).

Diamond drilling in 1984 increased measured and indicated ore reserves by 18% (Table 2-15). Exploration in 1985 was limited to establishing the east boundary of the Keel Zone and drilling some fill-in holes. Improvements in operating practices in 1985 resulted in an increase in milling capacity from 819 kt to 939 kt. Polaris was shut down for several weeks during the Christmas holiday season in 1984 and 1985.

TABLE 2-15: PRODUCTION AND RESERVES, POLARIS, 1981-1985

	PRODUCTION			RESERVES		
Year	kt mined	kt zinc	Kt lead	kt reserves	% Zn	%Pb
1981	26	3.4	1.1	–		
1982	470	74	30.2	9,980	15.2	4.4
1983	829	132.2	38.9	16,870	14.8	4.1
1984	847	110.5	28.4	19,958	14.3	3.8
1985	936	117.8	30.0	19,000	14.3	3.8

Source: mill throughput and output from Minining Inspection Service of the Goverment of the NWT. Reserves from Cominco annual reports. Note: throughput of 819 kt in 1984 and 939 kt in 1985 (Cominco Annual Reports) differs slightly from throughput reported by Mining Inspection Service.

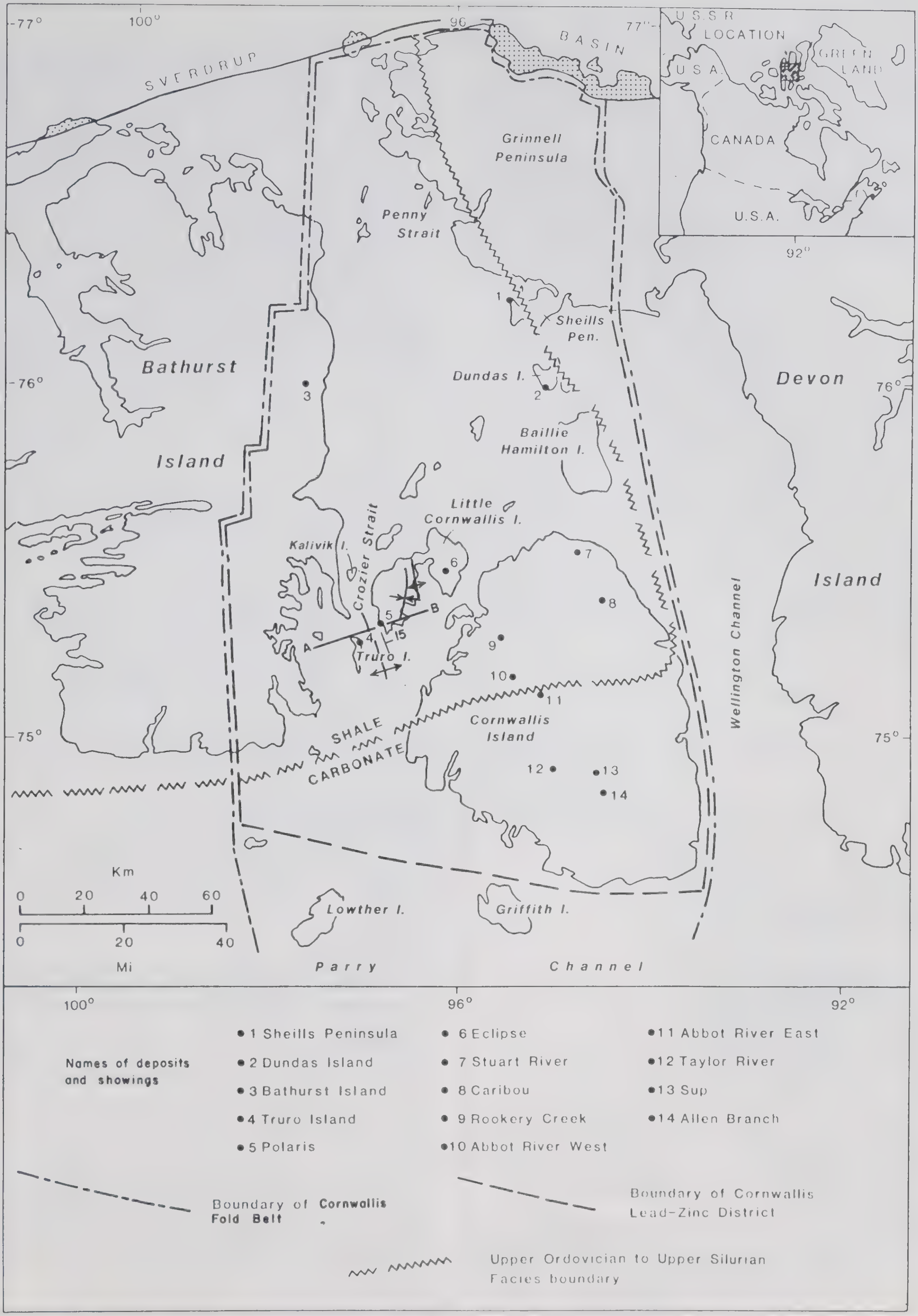

FIGURE 2-12: Index map showing lead-zinc deposits of the Cornwallis District. AB is the approximate section of Figure 2-13 (from Kerr, 1977b).

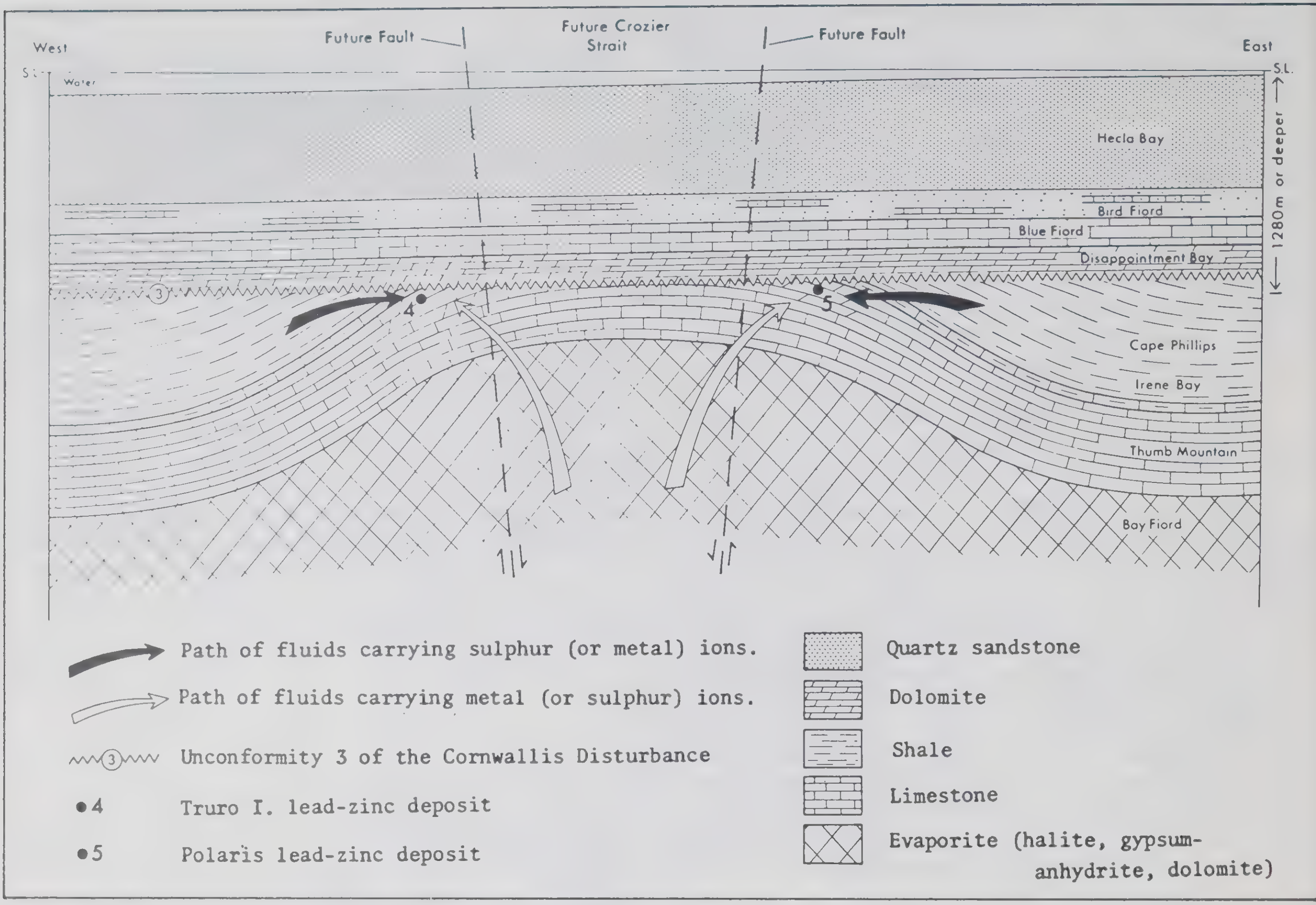

FIGURE 2-13: Reconstructed section along AB of Figure 2-12 showing the stratigraphic position of the Truro Island and Polaris deposits (from Kerr, 1977b).

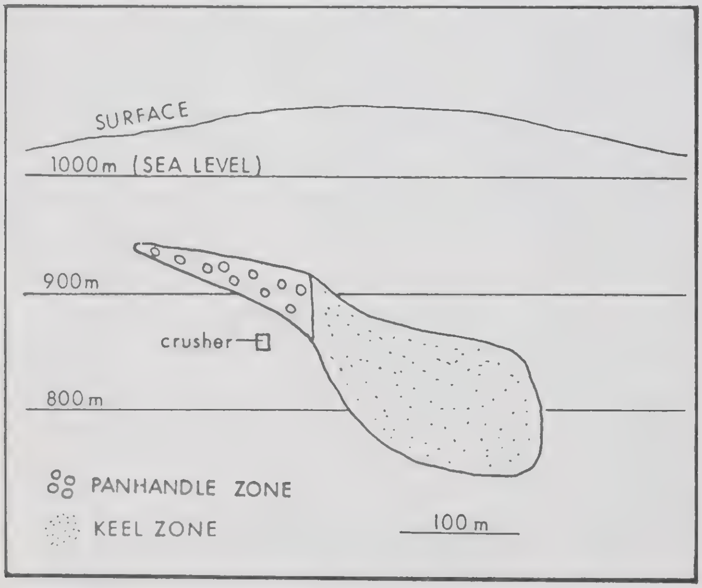

FIGURE 2-14: North-facing cross section showing the shape of the Polaris deposit, Panhandle Zone and Keel Zone (from Cominco information brochure "Welcome to Polaris")

CANTUNG MINE

Canada Tungsten Mining Corp. Ltd.	Tungsten
P.O. Box 9 Tungsten, NWT	105 H/16
X0A 0A0	61°58′N, 128°15′W

REFERENCES

Cummings and Bruce (1977); Dick and Hodgson 1982); Gabrielse and others (1973); Zaw and Clark (1978).

PROPERTY

AC 1-7; BC 1-8, 10-11; CED 59-65, 67-73; EF 2, 5-8; RL 1, 3-5, 8-10, 19-20; WO 1-11.

LOCATION

Cantung is near the headwaters of Flat River in the Selwyn Mountains, 644 km west of Yellowknife and less than 3 km east of the Yukon border. The town of Tungsten is serviced by a 306 km all-weather gravel road from Watson Lake, 209 km to the south in the Yukon Territory, and a 1219 m gravel airstrip.

HISTORY

A skarn in the floor of a mountain cirque at an elevation of 1524 m was discovered and staked as a copper prospect for Northwestern Explorations Ltd. in 1954. After exploration and drilling, the copper potential was deemed subeconomic and in 1958 the claims were allowed to lapse. Aware of scheelite in the deposit, the Mackenzie Syndicate immediately restaked the claims and Canada Tungsten Mining Corporation was formed to acquire and develop the property. Exploration indicated about 1 Mt grading 2.47% WO_3 recoverable by open pit mining, which began in November of 1962. In 1970, exploratory drilling outlined a new ore zone (E-Zone) 550 m north of and 122 m below the open pit. Open-pit mining was phased out in 1974, when year-round underground operations began. Expansion of the mill was completed in 1979, doubling capacity from 450 tpd to 900 tpd and making Cantung the largest tungsten mine in the Western Hemisphere.

DESCRIPTION

The main regional structure in the Cantung area is a northwest-trending syncline cored by Cambrian limestone, flanked by Cambrian or earlier phyllite and intruded by Cretaceous quartz monzonite stocks (Fig. 2-15). At Cantung, the "Mine Stock" has altered some of the limestone to ore-bearing skarn.

The following description is mainly after Dick and Hodgson (1982). Ore-bearing skarns at Cantung are found in two distinct lithological units: the Ore limestone, which contains the bulk of the ore, and the Swiss Cheese limestone (Fig. 2-16). The Ore limestone is a relatively pure, 70 m thick, coarsely crystalline, massive marble of Lower Cambrian age (Blusson, 1968). The underlying Swiss Cheese limestone is an equally thick unit comprising calcareous rock enclosed in a non-calcareous pelitic matrix. Only the calcareous component is significantly altered to skarn which, when mineralized, is termed "chert ore" by Cantung geologists. The Ore and Swiss Cheese limestones are sandwiched between fine-grained, brown hornfels units known as the Upper and Lower Argillite. This sequence has been deformed into a recumbent anticline and slightly displaced by high-angle faults.

There are two separate orebodies at Cantung; the open pit orebody and the E-Zone orebody. The open pit orebody, on the gently-dipping upper limb of the anticline, is in both the Swiss Cheese and Ore limestone. The E-Zone orebody, on the flat-lying lower limb of the anticline adjacent to the contact with the Mine Stock, is mainly in the Ore limestone (Fig. 2-16). The thickness and grade of ore in the E-Zone orebody diminishes rapidly as the dip of the beds steepen towards the hinge of the anticline.

The pit orebody, now mined out, was a shallowly southwest-dipping lens about 91 m wide and 20 m thick, cut by quartz-microcline-scheelite veins and altered to a fine-grained clinopyroxene-garnet skarn containing pyrrhotite, scheelite, chalcopyrite and sphalerite. The Swiss Cheese limestone (chert ore) was lower grade and contained scheelite and pyrrhotite.

The E-Zone orebody is over 600 m long and typically 12 m thick by 60 m wide. Zaw (1976) showed that the E-Zone has an internal zoning broadly conformable to stratigraphy and comprising an upper zone of hedenbergite pyroxene and Fe-Mn-rich grossular, an intermediate amphibole-rich zone and a footwall biotite skarn. The E-Zone orebody contains scheelite, chalcopyrite, sphalerite, and non-magnetic pyrrhotite.

The Mine Stock is a quartz monzonite intrusion enveloped by an extensive thermal metamorphic aureole. It ranges from equigranular and porphyritic in texture and consists mainly of microcline, quartz, plagioclase and biotite. Quartz veinlets containing minor pyrite, arsenopyrite, scheelite and tourmaline are abundant in the stock near the skarn contacts.

Conversion of Ore limestone to skarn is considered to have taken place over a short period at a shallow depth (1000 bars) and at a temperature of 450ºC. The locus of skarnification and mineralization is thought to have migrated towards the roof of the Mine Stock as it cooled (Zaw and Clark, 1978).

CURRENT WORK AND RESULTS

A ten-year summary of production and reserves at Cantung is given in Table 2-16. Operations resumed in 1984 after a 10.5-month shutdown the previous year. Productivity was comparable to previous complete years of operation, despite a 20% reduction in the number of employees, because of the introduction of bulk-mining procedures using large-diameter blast holes. Productivity was further enhanced by using remote-control load-haul-dump equipment and a new hydraulic backfill plant.

Underground diamond drilling (11,242 m) was carried out up to 210 m west of the previously defined orebody, and deposits of mineable grade were defined. Underground development included 1242 m of drifting and 242 m of raising.

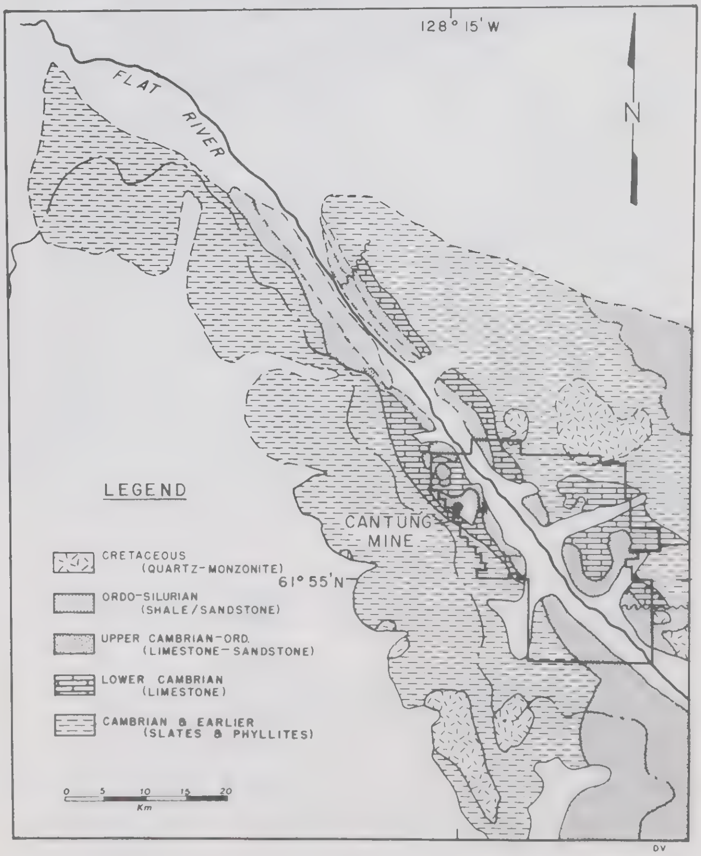

FIGURE 2-15: Regional geology, Cantung Mine area (from Gabrielse and others, 1973)

A million dollars was spent on surface exploration, mainly near the mine. This work included sampling, mapping, surveying and the drilling of one 900-m hole.

Underground exploration to the west of the existing orebody continued in 1985, although no surface exploration was done. In the latter half of 1985, a new management team for mine operations was organized and a revised mine plan was completed by J.S. Redpath Ltd. Based on work done by that company and the engineering staff of Canada Tungsten, the estimate of mineable ore reserves was reduced by almost 50% (Table 2-16).

TABLE 2-16: PRODUCTION AND RESERVES, CANTUNG MINE, 1976-1985

	PRODUCTION		RESERVES	
Year	kt milled	kt WO_3	kt reserves	grade % WO_3
1976	170	2.2	3800	1.55
1977	165	2.3	3810	1.55
1978	175	2.9	3810	1.55
1979	245	3.3	3540	1.55
1980	317	4.0	3270	1.55
1981	215	2.5	3220	1.50
1982	328	3.6	2750	1.32
1983	36	0.35	2700	1.32
1984	307	3.5	2540	1.39
1985	346	3.7	1360	1.24

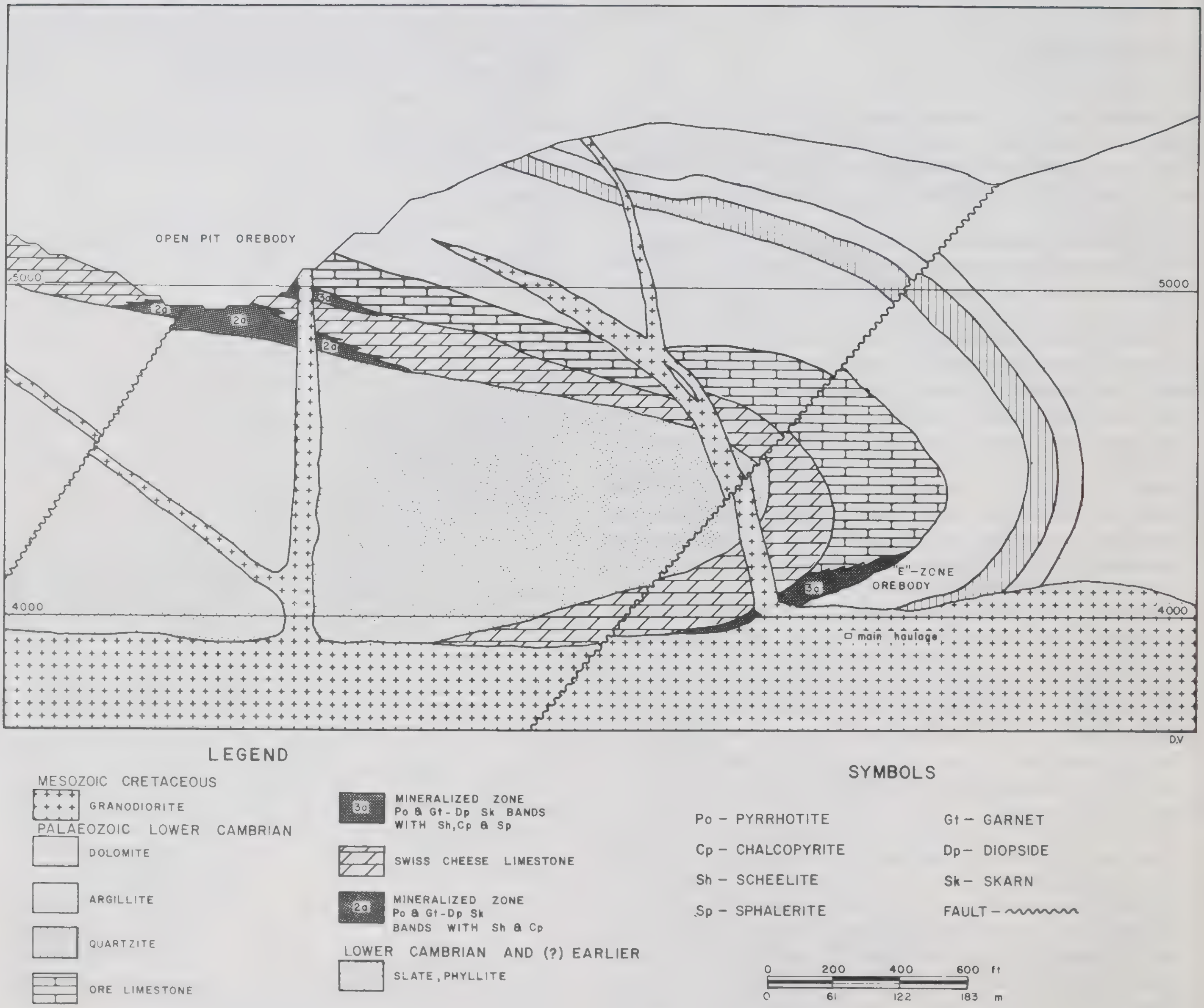

FIGURE 2-16: Typical geological cross section, Cantung Mine (after Cummings and Bruce, 1977)

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CHAPTER 3
CORDILLERAN DISTRICT

J.A. Brophy
Cordilleran District Geologist

The Cordilleran District extends from the Mackenzie Delta south to 60ºN latitude and from the mountains just east of the Mackenzie River to the Yukon Border. It comprises mainly the Northwest Territories part of the Cordilleran Orogen.

There was little exploration in 1984 and 1985 (Fig. 3-1) because markets were supressed for those mineral commodities (tungsten, zinc, lead and cobalt) that are the main exploration targets in this part of the Cordillera. Only 14 assessment reports were submitted documenting exploration work done in 1984. These described work done on prospects for tungsten skarns (5 reports), auriferous skarns (1 report), placer gold (6 reports), auriferous veins (1 report) and carbonate-hosted zinc-lead-silver deposits (1 report). At the time of writing (April, 1986), only one report had been submitted

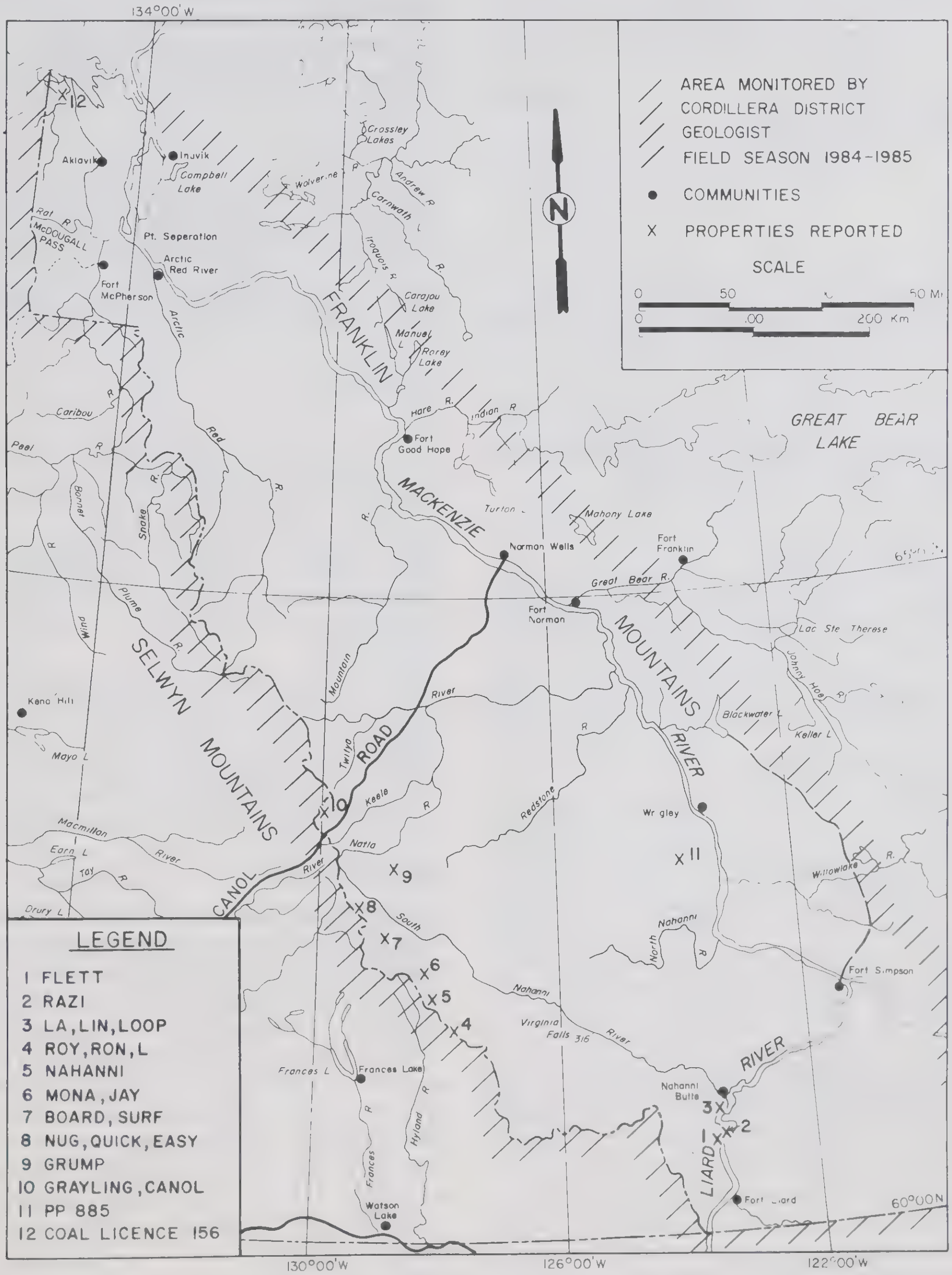

FIGURE 3-1: Active properties in the Cordilleran District, 1984-1985.

documenting work done in 1985. This report was for a syngenetic-exhalative zinc-lead-silver prospect. Additional reports for 1985 work will be summarized in the next volume of the Mineral Industry Report. Synopses of previously unreported work done on a coal licence in 1982 and on a placer gold prospect in 1983 are also included in this chapter.

The sequence of properties described is in order of increasing NTS number.

RAZI CLAIMS

David Smith	Gold
Box 2315	95 B/11
Yellowknife, NWT,	60°45′N, 123°21′W
X1A 2P7	

REFERENCES

Hawes (1980); Lord (1983).
DIAND assessment report: 081726.

PROPERTY

RAZI 1-2 (166 ha).

LOCATION

The claims are about 60 km north of Fort Liard and within 1 km of the Liard Highway (Fig. 3-1).

HISTORY

The claims were staked in 1980 to cover auriferous gravel bars in the Liard River reported by Lord (1983).

DESCRIPTION

The claims are underlain by alluvial gravel, sand and silt of the Liard River flood plain. The closest outcrops to the east are marine shales and thin-bedded sandstones of the Cretaceous Fort St. John Group, and to the west are upper Paleozoic limestones and shales of the Flett Formation. These are cut by a series of north-striking thrust faults (Hawes, 1980).

CURRENT WORK AND RESULTS

In 1983, 13 pits were excavated on a point bar on the west side of the river. About 0.06 m^3 of material was removed from each pit. This material was mixed, collected in 4000 cm^3 boxes, and sieved through a 20 mesh screen. An estimate of the sand and silt fraction was made and half the sieved material was bagged for assay. The other half was pan-assayed by counting gold grains and classifying the grains according to size: large, greater than 0.4 mm; medium, between 0.1 and 0.4 mm; and small, less than 0.1 mm.

Of thirteen assays, twelve were less than 0.1 ppm and one was 0.1 ppm. The pan assay for this latter sample was 2 large grains and 1 small grain. Gold grains were found in all pan assays.

FLETT, LA, LIN, LOOP, NET CLAIMS LIARD RIVER RECONNAISSANCE

Hudson Bay Mining &	Gold
Smelting Co. Ltd.	95B/12,13,14
P.O. Box 28,	60°53′N, 123°30′W
Toronto-Dominion Ctre,	
Toronto, Ont., M5K 1B8	

REFERENCES

Camsell and Malcolm (1921); Dawson (1889); Hage (1945); Hawes (1980); Hume (1923); Lord (1983);McConnel (1890); Turner (1975).
DIAND assessment reports: 081920 to 081925.

PROPERTY

FLETT 1-2 (1337.6 ha), LA-1 (334.4 ha), LIN-1 (334.4 ha), and LOOP 1-6 (1463 ha).

LOCATION

The claims cover parts of an 80 km long, meandering stretch of the Liard River north of Flett Rapids and south of Nahanni Butte. The straight-line distance from the southernmost FLETT claims to the northernmost LIN claim is only 25 km. The claims are all within 3 to 15 km of the all-weather road that parallels the Liard River and links Fort Liard to Fort Simpson.

HISTORY

The Liard River area was selected by Hudson Bay Mining and Smelting Co. Ltd. for placer gold exploration on the basis of a reconnaissance gold sampling program by Lord (1983). However, placer gold on the Liard River was reported as early as the late eighteen hundreds (Dawson, 1889; McConnel, 1890). Turner (1975) describes a 1935 venture in which 622 g of gold were recovered from Liard River point bars. Small scale gold mining continues today on several Liard River claims (Lord, 1985).

Geological investigations along the Liard River were conducted by Camsell and Malcolm (1921), Hage (1945) and Hume (1923).

The Hudson Bay claims were staked in 1983 to cover the most favourable ground identified after a reconnaissance sediment sampling program conducted that year.

DESCRIPTION

The reconnaissance area is within the flood plain of the Liard River between Nahanni Butte and Flett Rapids. The valley in this area is up to 8 km wide. Outcrops of shale, carbonate and coarse-grained clastics of Devonian to Cretaceous age are restricted to road cuts and to the valleys of tributary streams.

The oldest unconsolidated deposits are clay-rich glacial tills exposed at Flett Rapids. These are overlain by post-glacial lacustrine clay, 2.5 m of gravel and a thick sequence of deltaic sands and silts. The river banks consist of well-sorted gravels overlain by various thicknesses of silt. The older gravel deposits are overlain by the thickest silt deposits and thus form the highest banks. The youngest gravels make up point bars that are forming now. Gold is concentrated at the interface between gravel and overlying silt. Greatest concentrations are in

the youngest gravel deposits that have been reworked the greatest number of times.

CURRENT WORK AND RESULTS

Work in 1983 consisted of reconnaissance-level sampling of Liard River sediments between Flett Rapids and Nahanni Butte and more detailed sampling in the vicinity of the claims that were staked as a result of this reconnaissance. One hundred and sixty-nine sites were sampled at about 1 km intervals on both sides of the Liard River. At 101 sites, three to four samples were collected consisting of at least one 0.33 m channel sample across a gravel/silt interface and slightly longer channel samples of the overlying silt and underlying gravel. The volume of each sample was about 10,000 cm³. At 68 sites, channel banks were not developed and a 28,000 cm³ sample of gravel was collected instead. All samples were panned to about 10 g of black sand and gold grains in the concentrate were counted. About half of the samples were assayed for gold. Bulk samples of about 0.76 m³ were collected at 9 sites where above-average counts of gold particles had been obtained. A 20 g concentrate from this material was assayed after the sample was reduced by processing in a Pan-O-Matic sluice box, a gold pan and a cyclone. Some testing of equipment and orientation sampling was also done, as was some detailed sampling on the FLETT claims.

The number of gold grains in the 10 g channel and point-bar concentrates ranged from 0 to 600. The gold is fine and flaky (30,000 to 150,000 grains/g of gold). Some randomly selected assay results for various channel, point-bar and follow-up samples are:

Au grains	Volume	Concentrate Weight	Assay
400+	10,000 cm³	13.4 g	229.2 ppm
200+	10,000 cm³	5.8 g	928.1 ppm
43	10,000 cm³	13.6 g	25.0 ppm
14	10,000 cm³	17.4 g	8.9 ppm
3	10,000 cm³	8.7 g	0.1 ppm

Work done in 1984 consisted of seismic and radar orientation surveys on FLETT 1 to establish bedrock and glacial till profiles beneath the river alluvium. The surveys were carried out on contract by A-Cubed Inc. of Mississauga, Ontario.

Three cut lines totalling about 4 km were surveyed, including a short test line on which a 3.8 m deep pit was excavated through silt to the silt/gravel interface. The radar survey succeeded in pin-pointing a discontinuity at that depth on the test line. Seismic surveys detected a reflector, probably bedrock, at depths of 60 m to 90 m. It was recommended that a fence of holes be drilled along one of the geophysical lines to test the bottom gravels.

ROY, RON, L CLAIMS

Logan Mines Limited	Lead,Zinc,Gold,Silver
305, 535 Thurlow St.	95 E/12
Vancouver, B.C., V6E 2L2	61°37′N, 127°40′W

REFERENCES

Gabrielse and others (1973). DIAND assessment reports: 060568, 062025, 081009, 081011, 081171, 081349, 081552, and 081929.

LOCATION

The claims are 51 km southeast of Tungsten and 39 km northeast of the Hyland River airstrip, which is near the Canol Road in the Yukon. Access to the property is by helicopter from Tungsten or the Hyland River airstrip.

PROPERTY

ROY 1-15 (20.9 ha), ROY 16 (83.6 ha), ROY 17 (250.8 ha), RON (606.1 ha) and L (1003.2 ha).

HISTORY

The area was first staked as ROY 1-60 in 1968 and evaluated in 1969 by Conwest Exploration Company Limited under agreement with Cassiar Asbestos Corporation Limited. Work consisted of mapping, trenching and channel sampling on ROY 5, 6, 7, 8, 11 and 12. The rest of the group was prospected and reconnaissance silt sampling of a drainage area was done (DIAND assessment report 060568). The main showings were on ROY 7 and 11.

Massive to semi-massive sulphides consisting of galena, sphalerite and minor arsenopyrite and pyrrhotite are irregularly distributed in a 325 m long shear zone that is seldom wider than 1 m. Gold in excess of 3 g/t (maximum 8.7 g/t) was detected in 8 of 32 rocks that were assayed. Silver ranged from 26 to 980 g/t, lead from 0.6% to 46% and zinc from trace to 12%. Another 149 ROY claims were staked in 1969 to protect the core group, but no work was documented.

The area was restaked several times, most recently as ROY 1-15 by Jake Melnychuck in 1977. Some work was reportedly done in 1977 and 1978 by Amoco Canada Petroleum Company Limited, but there is no record of this in the assessment files. The claims were transferred to Logan Mines Limited in 1979. Petrological work done that year led investigators to conclude that the layered sulphides in the main zone are sedimentary-exhalative (syngenetic) in origin (DIAND assessment report 081109).

Additional work in 1979 included grid-based soil sampling and magnetometer surveys on the main showing (ROY 3) and channel sampling at 17 trenches. Seventy-five samples of immature post-Pleistocene soils were analyzed for copper, lead, zinc, silver and gold. Average results are as follows: 36 ppm Cu, 188 ppm Pb, 381 ppm Zn, 0.6 ppm Ag, and 15 ppb Au. Twenty-three channel samples, collected from trenches, assayed up to 0.03% Cu; 2% to 30% Pb; 2% to 12% Zn; 93 to 780 ppm Ag; and 0.15 to 6.0 ppm Au. The widest channel sample (3.6 m) assayed 0.01% Cu, 2.55% Pb, 2.18% Zn, 100 ppm Ag and 6.0 ppm Au. Magnetic surveying proved unsuccessful in outlining the deposit (DIAND assess-

ment report 081011). ROY 16 and 17 were added to the group in the fall of 1979.

In 1980, additional prospecting, trenching and soil sampling surveys were conducted. Horizontal loop EM surveys delimited a conductor having a signature similar to that observed over exposed massive sulphides on the property, and a position consistent with a projected extension of these main showings (DIAND assessment reports 062025 and 081171).

In 1981, twelve diamond drill holes totalling 582.5 m probed the area of the main showings. Most of the holes cut sulphide-rich rock; one of the better intersections was in DDH6-81 between 23.5 and 26.8 m: 4.7% Pb, 3.34% Zn, 133 ppm Ag, and 0.34 ppm Au (DIAND assessment report 081349).

RON was added to the ROY group in the autumn of 1981.

Detailed geological mapping and another soil survey in the vicinity of the main showings was completed in 1982 (DIAND assessment report 081552). L, to the east of RON, was staked in 1985 to protect anomalies outlined by a 1984 silt-sampling survey, which was not submitted for assessment.

DESCRIPTION

The property is underlain by coarse clastic sediments of the Proterozoic 'grit unit' and overlying sediments of the Proterozoic 'phyllite unit' and the Lower Cambrian Sekwi Formation, which includes both clastic and carbonate deposits. The Sekwi Formation is overlain, apparently unconformably (Gabrielse and others, 1973), by carbonates of the Upper Cambrian to Lower Ordovician Rabbitkettle Formation. However, Logan Mine's geologists could find no evidence of this unconformity despite careful mapping of the contact areas. The carbonates might represent a facies equivalent of the Sekwi Formation.

The principle showings are in dark, cherty beds of the Sekwi Formation just below the contact with the Rabbitkettle Formation. They are exposed intermittently in trenches around the periphery of the north-trending ridge (Roy Ridge) that cuts across the center of the core ROY 1-15 group. On the east slope of Roy Ridge, the showings are between the 1780 m and 1900 m contours, whereas on the west slope of the ridge the showings closely parallel the 1840 m contour. Assuming continuity beneath the Rabbitkettle Formation, which caps Roy Ridge, the inferred size of the zone is 1150 m in an east-northeasterly direction. The strata are cut by several easterly trending faults and by northerly trending granitic dikes, probably derived from a Cretaceous batholith several kilometres to the south. The beds appear to be gently folded, but are affected by at least four well marked cleavages. Bedding attitudes in the Rabbitkettle Formation vary considerably, but are most commonly northeasterly trending, dipping moderately to steeply north.

Massive sulphides are in decimetre to metre-thick beds in a zone that is up to 6 m wide in the upper part of the Sekwi Formation. The massive sulphides comprise fine-to coarse-grained galena, sphalerite, pyrite and arsenopyrite. At several locales, coarse-grained galena forms distinct beds, as do layers of fine-grained sphalerite associated with fragments of black shale. Numerous soft-sediment slump features are present. Above and below the massive-sulphide units are patches and veins of lower-grade material in siliceous host rock. Sulphide and sedimentary textures suggest that the layered sulphides are syngenetic in origin, having formed probably in a sedimentary-exhalative environment similar to that of the Sullivan Mine in southeastern British Columbia. Ore minerals consist of arsenopyrite, sphalerite, pyrrhotite and galena with minor marcasite, cubanite, chalcopyrite and native gold (?).

CURRENT WORK AND RESULTS

Work done in 1984 was not submitted as assessment, although references in the 1985 report (DIAND assessment report 081929) indicate that previously undiscovered showings were found over a wide area and that silt sampling was conducted that led to the staking of the L claim to protect anomalies.

In 1985, geological mapping, prospecting and reconnaissance soil geochemical surveying were carried out. Eighteen rock samples, 10 silt samples and 183 soil samples were collected and assayed or geochemically analyzed.

Fourteen showings and several locales of mineralized float were found. Eight of the showings are associated with an easterly trending fault that was traced from Roy Ridge east across the other four ridges covered by the claims, a distance of 7 km. Most of these showings are at contacts, either between cherty siltstone and carbonate as at the main showings on Roy Ridge, or between cherty siltstone and rusty weathering siltstone on the L claim. Eighteen samples collected from the showings assayed between 0.06 and 3.0 ppm Au (mode - 0.12 ppm), 3.1 and 427.0 ppm Ag (mode - 94 ppm), 1% to 34% Pb (mode - 5%) and 0.01% to 17% Zn (mode - 2.2%). All copper assays were less than 0.07%.

$100,000 drilling program and a $60,000 program of trenching, geological and geophysical surveys were recommended to further evaluate the property.

PROSPECTING PERMIT 885

Gerald Ryznar	Zinc,Lead,Silver
4405 Glencanyon Drive	95 J/13 NW
North Vancouver, B.C.,	63°00'N, 123°45'N
V7N 4B4	

REFERENCES

Douglas and Norris (1961, 1977); Hawes (1980).

DIAND assessment reports: 061342, 061393, 080325, 081632, 081817.

PROPERTY

Prospecting Permit 885 (17,728 ha).

LOCATION

The permit is 34 km south-southeast of Wrigley and 470 km west-northwest of Yellowknife.

HISTORY

The area was first acquired as LOU 1-20 by Cominco in the early seventies. Geological mapping and prospecting revealed numerous galena and sphalerite showings in silicified, brecciated and dolomitized zones of the Middle Devonian Nahanni Formation (DIAND assessment report 080325). NTS 95 J/13 was then acquired as Prospecting Permit 306 by Giant Yellowknife Mines Ltd. in 1974. Geological mapping and rock, soil and silt sampling surveys were done in 1974 and 1975.

Numerous showings of smithsonite, sphalerite, galena and bornite were found (DIAND assessment reports 061342 and 061393).

Permit 885 covering NTS 95 J/13 NW was issued to Gerald Ryznar in February 1982. In August of that year, Mr. Ryznar conducted a four-day examination of the property and collected two grab samples from known showings. These returned assays of 8% and 20.5% Zn, 3.9% and 10.3% Pb, and 12.1 and 23.9 ppm Ag (DIAND assessment report 081632).

DESCRIPTION

The main structural feature on the permit is the Camsell Thrust, which is marked by a prominent scarp paralleling the eastern boundary of the property (Douglas and Norris, 1961, 1977; Hawes, 1980). The thrust exposes a north-trending, west-dipping, 1 to 2 km wide belt of Middle Devonian sediments consisting mainly of carbonates of the Nahanni Formation. These are juxtaposed against the Upper Devonian sediments to the west that occupy the remaining 90% of the permit area. All rocks have been folded about northwest-trending axis.

The principal showings are in the belt of Nahanni Formation carbonates that parallels the eastern boundary of the permit. The majority of these are in the southeast corner of the permit, where the Nahanni Formation appears to have been thickened by a northwest-trending synclinal fold that bisects the property. Some of the showings are vein-like and carry as much as 38% combined Pb-Zn and 90 ppm Ag. Others appear to be mineralized breccias, while yet others consist of stratiform disseminated lead and zinc-bearing minerals. The strike length of most zones has not been established, although widths range up to 4.5 m. Mr. Ryznar suggested that the source of the base metals is the shale basin immediately west of the carbonate belt.

CURRENT WORK AND RESULTS

Because much of the area of interest on the permit is covered with overburden and vegetation, particularly black spruce, a biogeochemical survey of black spruce bark samples was undertaken in 1984 in an effort to indicate target areas for future work. The sampling was carried out by crews from Taiga Consultants of Calgary, Alberta.

Bark samples from black spruce trees were collected at 100 m intervals along lines set 100 m apart. At least 200 g of bark was collected at each station in the field. The sampling was done in the southeast corner of the permit, in an area known for its numerous showings, and in an area in which the overburden cover inhibits normal prospecting.

Results indicate at least three areas on the grid where there are coincident biogeochemical silver, zinc and lead anomalies. Analyses range to 0.137 ppm Ag, 179.0 ppm Zn and 0.83 ppm Pb. Follow-up geochemical soil sampling, geophysical surveys and surface trenching are recommended.

Permit 885 lapsed at the end of 1984 and RR1 was staked to protect areas of interest (DIAND assessment report 081817).

NAHANNI CLAIM

Canada Tungsten Mining Corp. Ltd.
P.O. Box 9, Tungsten, NWT,
X0H 0A0

Tungsten, copper
105 H/16
61°51′N, 128°03′W

REFERENCES

Blusson (1968, 1966).
DIAND assessment reports: 081386, 081770.

PROPERTY

NAHANNI (899 ha).

LOCATION

The property is in the Ragged Ranges of the Selwyn Mountains, 16 km southeast of Tungsten.

HISTORY

The claim was staked in July, 1979, to cover a tungsten-copper showing in a stratigraphic package similar to that at the Cantung Mine (Blusson, 1968). In 1981, several showings were sampled and the property was mapped at a scale of 1:7200 (DIAND assessment report 081836).

DESCRIPTION

Blusson (1966) conducted detailed mapping in the Cantung area and described the stratigraphy (Table 3-1).

This same stratigraphic sequence is present on the Nahanni claim except that Unit 6 is missing. Most of the claim is underlain by Units 9 and 5, but Units 1 to 3 crop out in the center of the property along the crest of a northwest-trending anticline, and outcrops of Unit 11 are present in the southeast corner of the claim.

The main showing is in Unit 2 at the crest of the anticline near the center of the property. At this locale, the anticline is isoclinal, apparently overturned, and plunges gently to the southeast (?). The showing comprises light-green, banded

TABLE 3-1: STRATIGRAPHY OF THE CANTUNG AREA

UNIT 11:	Cretaceous quartz monzo-granodiorite intrusions.
UNIT 9:	Middle and Upper (?) Cambrian silty grey limestone of the Rabbitkettle Formation.
UNIT 6:	Lower and Middle Cambrian sandy and sparry dolomite of the Sekwi Formation.
UNIT 5:	Lower Cambrian grey crystalline limestone and marble; Blusson's "Ore Limestone" unit and host to the underground orebody at Cantung.
UNIT 3:	Lower Cambrian grey crystalline limestone and marble; Blusson's "Ore Limestone" unit and host to the underground orebody at Cantung.
UNIT 2:	Lower Cambrian interbedded cherty argillite, siltstone and limestone; Blusson's "Swiss Cheese Limestone" unit and host to the open- pit orebody at Cantung that has now been mined out.
UNIT 1:	Lower Cambrian and earlier (?) slate, siltstone and fine-grained quartzite; Blusson's "Lower Argillite" unit.

skarn containing disseminated scheelite and chalcopyrite and fracture fillings of quartz and chalcopyrite. Two chip samples of skarn from one locale assayed 0.42% WO_3 across 1.8 m and 0.34% WO_3 across 1.6 m. Another pair of chip samples collected from skarn 60 m to the west assayed 0.47% WO_3 across 1.5 m and 0.35% WO_3 across 1.5 m. A grab sample assayed 0.82% WO_3 and 0.92% Cu.

Another type of showing on the property consists of tungsten and copper-bearing skarn and massive sulphide lodes in Unit 5 adjacent to the biotite-quartz monzonite stock near the southeast corner of the claim. The massive sulphide lodes are in an easterly striking, steeply northeast-dipping quartz vein that is up to 5.5 m wide and has been traced for at least 300 m. The vein is deeply weathered and forms a manganiferous gossan. The lodes consist of massive pyrrhotite and minor chalcopyrite, scheelite and pyrite. One series of chip samples across a massive sulphide lode returned 0.49% WO_3 across 5.5 m. In the same general area, several chip and grab samples were collected from outcrops of tungsten and copper-bearing diopside and garnet skarns. The best assay obtained was 0.50% WO_3 and 2.0% Cu across 4 m.

In addition, four other types of showings were found on the property. These are:

1) Tungsten and copper-bearing skarn in Unit 5 near the main showing;
2) Tungsten and copper-bearing skarn associated with dikes throughout the property;
3) Tungsten, copper and molybdenum-bearing quartz stockworks in portions of the biotite-quartz-monzonite stock;
4) Auriferous (?) quartz-arsenopyrite-pyrite-scorodite veins that crosscut the stock and altered country rocks.

CURRENT WORK AND RESULTS

In 1984, the main showing was trenched and sampled. Seven trenches (0.6 m deep, 1.2 m wide and 6.1 to 24.4 m long) were excavated and 1.5 m long chip samples were collected for assay. An eighth trench was excavated but not sampled. Assays of 43 chip samples are as follows:

WO_3: the best assay was 0.56%; three assays range from 0.16% to 0.18%; the remaining 39 assays range from 0.01% to 0.06%

Cu: two assay of better than 1% (1.52% and 2.78%) correspond with high WO_3 assays; 41 assays range from 0.01% to 0.88%

Zn: the best assay, 2.78%, corresponds with the high Cu and WO_3 assays; 42 assays are less than 0.42%.

MONA AND JAY CLAIMS

Goldex Resource Incorporated	Gold,Silver,Lead,Zinc
402, 1755 W. Broadway	105 I/1
Vancouver, B.C., V6J 4S5	62°06'N, 128°13'W

REFERENCES

Gordey (1980, 1981).

DIAND assessment reports: 060589, 080311, 081535, 081659 and 081918.

PROPERTY

JAY 1-2 (167.2 ha), MONA 1-3 (167.2 ha).

LOCATION

The claims are in the valley of Zenchuck Creek, 15 km north of Tungsten. Access is by helicopter, which is often available at Tungsten. The road to Tungsten passes within 10 km of the property.

HISTORY

Regional geological, geophysical and geochemical surveys were done by Canada Tungsten Mining Corporation on Prospecting Permit 26 in 1961, but only one small scheelite-bearing skarn was found and the permit was allowed to lapse (DIAND assessment report 060589).

JAY 1-12, RIO 13-24 and LEO 1-12 were staked by Alex Black in 1973 and examined that year by Gavin Dirom for the TCL Exploration Group. Samples collected from showings were assayed for gold and other elements. Best assays were 1.55 ppm Au, 51.6 ppm Ag, 2.03% Pb, 2.2% Zn and 18.8% As (DIAND assessment report 080311).

Alex Black excavated 2 trenches on JAY 5 in 1981 and sampled these trenches and several other showings. Best assays from 12 samples were 5.3 ppm Au, 212 ppm Ag, 14.3% Pb, 3% Zn and 0.069% WO_3 (DIAND assessment report 081535).

All of the original JAY claims as well as the LEO and RIO claims were allowed to lapse.

MONA 1 was recorded by Alex Black in July of 1981. A 9 m pit was excavated near the southeast corner of the claim in 1983 and eight samples were collected and assayed for gold and silver. Assays ranged from 0.093 ppm to 7.8 ppm Au and 0.31 ppm to 80.9 ppm Ag (DIAND assessment report 081659).

JAY 1 and 2 were staked by Alex Black in 1983 and transferred, along with MONA 1, to Goldex Resource Incorporated that year. MONA 2 and 3 were staked for Goldex in 1984.

DESCRIPTION

The claims cover the valley of Zenchuck Creek, a northwest-trending tributary of Flat River, at elevations ranging from 1340 m to 1525 m. To the southwest of Zenchuck Creek, where all of the 1984 work was done, the property is underlain mainly by Helikian to Lower Cambrian phyllites of the Backbone Ranges Formation. To the northeast of the creek, the claims are underlain by Lower Cambrian quartzite and siltstone as well as a 150 m wide band of carbonate that has been converted to marble in proximity to a Cretaceous quartz-monzonite stock that outcrops northeast of the property.

The phyllites of the Backbone Ranges Formation are mainly northwest trending and steeply northeast dipping. Foliation generally dips steeper than bedding, but is rarely vertical. Variations in dip directions suggest that the various showings may be on the axis of a shallowly southeast-plunging anticline.

The showings consist of swarms of veins ranging in width from 5 to 100 cm, averaging 15 cm. The veins strike 130° to 140° and dip vertically or steeply northeast. Most veins parallel schistosity in the enclosing phyllites, but in several locales cross-veinlets intersect the foliation-parallel veinlets. Locally, quartz veining is so prevalent that they can be deemed stockwork deposits.

The veins consist of quartz, minor calcite, and variable amounts of arsenopyrite, pyrite, sphalerite, galena and chalcopyrite (in order of abundance). Tourmaline and stibnite were occasionally observed. The larger veins appear to follow faults or fractures subparallel to foliation. The phyllite adjacent to sulphide-rich veins is lightly hornfelsed and occasionally chloritized.

CURRENT WORK AND RESULTS

A grid was established, mainly on MONA 1 and 3, with a 450 m long northwest-oriented baseline and 600 m long wing lines at 150 m intervals. Soil and rock sampling, VLF-EM and magnetometer surveys were conducted on the grid.

The soil sampling survey detected arsenic anomalies ranging to 4000 ppm, lead to 455 ppm, silver to 1.3 ppm and gold to 140 ppb. Only five samples had greater than 10 ppb Au. The tenor of arsenic in the soils is particularly high, with most samples returning more than 100 ppm As. Arsenic, lead and silver anomalies show moderately good correlation, and several zones warranting further evaluation were identified.

Thirteen of 36 rock samples (grab and chip) collected on the grid assayed better than 0.31 ppm Au to a maximum of 8.5 ppm Au. However, the best assay from veins exposed in pits along the baseline was 1.06 ppm Au across 1 m.

The magnetometer survey did not yield useful information, but VLF-EM conductors were found over mineralized veins using the Hawaii and Seattle transmitting stations.

Additional claim staking, gridding, soil sampling, trenching, geological mapping, VLF-EM surveying and diamond drilling were recommended (DIAND assessment report 081918).

BOARD, SURF CLAIMS

Placer Development Ltd.	
Box 49330,	Tungsten
Bentall Postal Station	105 I/7
Vancouver, B.C., V7X 1P1	62°20'N,128°55'W

REFERENCES

Goodfellow (1982); Gordey (1980, 1981).
DIAND assessment reports: 080356, 080400, 080556, 081803.

PROPERTY

BOARD (669 ha) and SURF (334 ha).

LOCATION

The claims are 65 km north-northwest of Tungsten.

HISTORY

The area of the claims was staked as the ALPHA, BRAVO, ECHO and CHAR claims by Mr. Cliff Turner in 1973. Between 1973 and 1976, several companies worked the property, undertaking geological, geophysical and geochemical surveys. Several diamond and percussion holes were drilled to test a silver-lead-zinc showing (Fern Showing). The claims lapsed in the late seventies (DIAND assessment reports 080356, 080400, 080556)

On August 2, 1982, the Geological Survey of Canada (GSC) released the results of a geochemical silt sampling program covering the Nahanni map-area (Goodfellow, 1982). SURF was staked in November of that year to cover tungsten anomalies detected in the GSC survey. BOARD was added to the north and east of SURF in 1984.

DESCRIPTION

The claims are underlain by siltstone, fine-grained quartz arenite and slate of the Proterozoic Backbone Range Unit (Gordey, 1981). Carbonates of the Upper Cambrian Rabbitkettle Formation lie to the south and west of the claims and host the Fern Pb-Zn-Ag skarn showing. No intrusion has been mapped or identified in the area, although the presence of the Fern skarn suggests that there may be one at depth.

CURRENT WORK AND RESULTS

The following types of samples were collected on and around the property in 1982, 1983 and 1984:

1) stream sediment samples: seven in 1982, nine in 1983, eight in 1984.
2) creek-bank soil samples: 30 in 1984.
3) heavy mineral samples: one in 1982, five in 1983. Approximately 7 to 8 kg of sieved material (-20 mesh) was obtained from stream sediments. Two fractions were separated and analyzed; the coarse (-35 to + 150 mesh), heavy (S.G. greater than 3.0), non-magnetic fraction (CHN) and the fine (-150 mesh), heavy, non-magnetic fraction (FHN).
4) bulk samples: four in 1983, five in 1984. Approximately 2 to 3 kg of sieved material (-20 mesh) was obtained from stream sediments.

Samples collected in 1982 and 1983 were analyzed for copper, zinc, tungsten, arsenic, tin and antimony, the heavy mineral factions were also analyzed for lead, silver and gold. In 1984, all samples were analyzed for copper, lead, zinc, silver, tungsten, gold and tin.

Tungsten: Tungsten anomalies were found in all the sampled media, including: greater than 500 ppm in sediment; 5.7% in the CHN faction; 3.9% in the FHN faction; and 105 ppm in bank soil. Analytical results from bulk samples were generally lower than those from conventional stream sediments.

Gold: Gold contents of bulk, stream sediment and bank soil samples were below the detection limit (0.02 ppm). The highest gold analyses were from the CHN factions (0.04 ppm Au and 7.20 ppm Au) and FHN factions (1.77 ppm Au and 2.90 ppm Au) of the two heavy mineral samples in which the highest tungsten concentrations were found.

Tin: Up to 13 ppm Sn was obtained in stream sediments, greater than 500 ppm Sn in three heavy-mineral samples, and up to 18 ppm Sn in bank-soil samples.

Silver: Silver analyses from all sample media were either below the detection limit (0.2 ppm) or non-anomalous (maximum 1.3 ppm).

Copper, lead, zinc: Copper content ranged from 16 to 138 ppm, lead from 10 to 230 pm, and zinc from 57 to 217 ppm in stream sediments, bulk and soil-bank samples. The best lead-zinc anomalies were from streams draining the Fern showing.

Arsenic-antimony: Arsenic content of stream sediment and bulk samples was at or below the detection limit (2 ppm). The

highest arsenic anomaly was 280 ppm in the CHN faction of a heavy mineral sample. All antimony determinations were less than or equal to 3.3 ppm (DIAND assessment report 081803).

QUICK AND EASY CLAIMS

Hudson Bay Exploration &	
Development Co. Ltd.	Tungsten
P.O. Toronto-Dominion Centre	105 I/11
Toronto, Ont., M5K 1B8	62°39'N, 129°16'W

REFERENCES

Goodfellow (1982); Gordey (1981).
DIAND assessment reports: 080323, 081780.

PROPERTY

QUICK (418 ha) and EASY (263 ha).

LOCATION

The claims are 90 km north-northeast of Tungsten. They are adjoined and partly enveloped by Canamax's NUG claims (Fig. 3-2).

HISTORY

On August 13, 1982, the Geological Survey of Canada (GSC) released the results of a geochemical silt sampling program covering the Nahanni map-area (Goodfellow, 1982). QUICK was staked that same day to cover a 60 ppm tungsten anomaly detected in the GSC survey. EASY was added on the north side of QUICK the following year. The claims cover part of an area that was staked in the early seventies by Cowal Resources Ltd. and explored for lead and zinc (ROD claims, DIAND assessment report 080323).

DESCRIPTION

The area is underlain by Upper Devonian to Mississippian pelitic sediments comprising chert-pebble conglomerate, chert-quartz arenite and wacke, and minor black shale, siltstone and slate (Gordey, 1981).

CURRENT WORK AND RESULTS

In 1983, several locales upstream from the tungsten anomaly were panned. Scheelite grains in the heavy-mineral concentrate were counted and classified according to grain size.

In 1984, a twenty person-day program of panning, soil sampling and magnetometer surveying was conducted. A crude (topofil and flagging) grid was established to control the surveys. Forty-one samples were collected at 100 m intervals along six north-trending winglines separated by 100 m (winglines on either side of the creek from which the tungsten anomaly was obtained; baseline along the EASY-QUICK claim boundary). Results of the analyses are: Trace to 1.4 ppm Ag, 4 to 42 ppm Cu and 2 to 38 ppm W. There is a moderate correspondence between tungsten and copper anomalies on the east side of the creek, where a broadly anomalous zone appears to be open to the south. The magnetometer survey outlined an east-northeast trending magnetic low that is unrelated to the pattern of the copper-tungsten anomaly in soils (DIAND assessment report 081780).

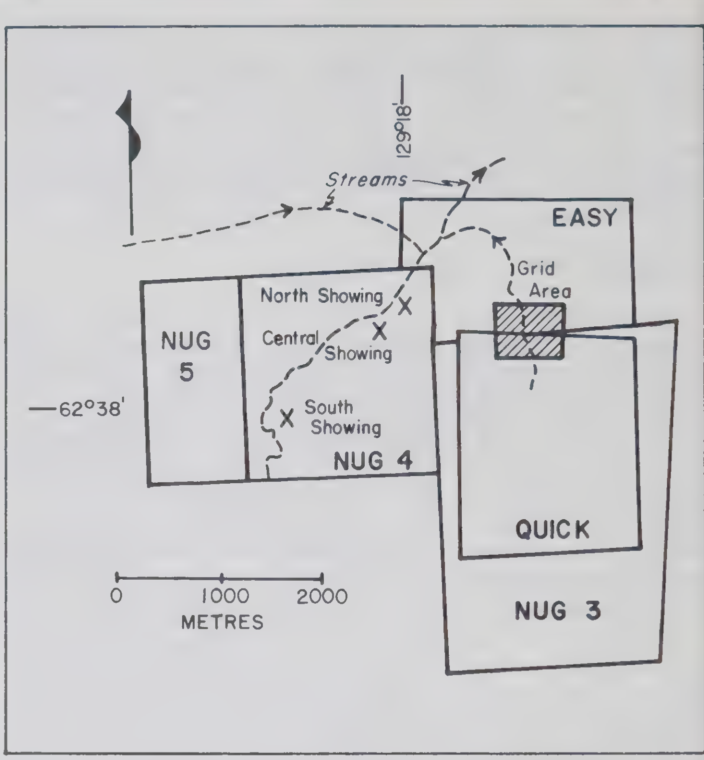

FIGURE 3-2: Property map outlining grid area on the QUICK-EASY claims and showings on the NUG 4 claim.

NUG CLAIMS

Canamax Resources Inc.	Tungsten
601-535 Thurlow St.	105 I/11
Vancouver, B.C., V6E 3L6	62°37'N, 129°15'W

REFERENCES

Goodfellow (1982); Gordey (1981).
DIAND assessment reports: 081781, 080323.

PROPERTY

NUG 3-5 (947 ha).

LOCATION

The claims are 90 km north-northeast of Tungsten. They adjoin and partly envelope Hudson Bay Exploration and Development's QUICK and EASY claims (Fig. 3-2).

HISTORY

On August 3, 1982, the Geological Survey of Canada (GSC) released the results of a geochemical silt sampling program covering the Nahanni map-area (Goodfellow, 1982). NUG 3 was staked that same day to cover a 60 ppm tungsten anomaly detected in the GSC survey. NUG 4 was added to the property in July, 1983 and NUG 5 in June, 1984. The NUG claims cover part of an area that was previously staked in the early seventies by Cowal Resources Ltd. and explored for lead and zinc (ROD claims, DIAND assessment report 080323).

DESCRIPTION

The area is underlain by Upper Devonian to Mississippian pelitic sediments comprising chert-pebble conglomerate, chert-quartz arenite and wacke, and minor black shale, siltstone and slate (Gordey, 1981).

CURRENT WORK AND RESULTS

In 1982, a number of talus fines were collected and analyzed for tin and tungsten.

Work in 1983 consisted of geological mapping and prospecting for scheelite and wolframite. Three tungsten showings were found in outcrops along a northeast-flowing stream on NUG 4.

The South showing comprises several weakly hornfelsed outcrops cut by up to eight 1 to 25 cm wide coarsely crystalline quartz-sericite veins across a 10 m interval. The veins strike parallel to bedding (115° to 120°), dip vertically, and contain traces of pyrite and scheelite.

The Middle showing comprises coarse scheelite and wolframite in 2 to 30 cm wide quartz veins as well as disseminated scheelite and pyrrhotite in intervening sandy beds. The veins, most of which trend 125°, consist of coarse crystalline quartz and medial clots of late-stage pyrite, arsenopyrite, bismuth and bismuthinite. Scheelite crystals, which are often coarse (3 cm) and idiomorphic, locally constitute 10% to 50% of vein material. The sandy beds vary in width from 0.1 to 1.5 m and, where mineralized with fine to medium-grained scheelite, are uniformly mineralized across the width of the bed.

The North showing consists of six parallel, vuggy quartz veins in phyllite. The veins can be traced along strike for 30 m and are 1 to 10 cm wide. They host medial concentrations of carbonate and pyrrhotite as well as sparse disseminations of scheelite, wolframite and chalcopyrite. The country rocks in the vicinity of all three showings are marked by an alteration zone where the originally dark-grey to black sediments have been bleached a light grey to tan colour.

The 1984 work program consisted of detailed grid soil sampling, prospecting and geological mapping over a 9 km² area covering previously identified alteration zones on NUG 4. Approximately 910 soil and talus-fines samples were collected and analyzed for tungsten and zinc. Every fourth sample was analyzed for tin. Tungsten analyses ranged from 1 ppm to more than 2000 ppm, zinc from 6 to 500 ppm, and tin from 1 to 178 ppm. Soils collected in the vicinity of scheelite-bearing wacke beds and quartz veins had a low geochemical response (maximum 50 ppm W).

GRUMP CLAIM

Giant Yellowkife Mines Ltd.
Box 3000,
Yellowknife, NWT, X1A 2M2

Gold, Silver, Lead, Zinc, Arsenic
105 I/15
62°57′N, 128°43′W

REFERENCES

Grenn and others (1968); Gordey (1980).
DIAND assessment reports: 081108, 081914.

PROPERTY

GRUMP (523 ha).

LOCATION

The claim is 750 km west of Yellowknife and 75 km east-southeast of MacMillan Pass. Access is by helicopter, although float planes can land on O'Grady Lake 20 km west-northwest of the claim. The nearest reach of the Canol Road is 65 km to the northwest. The claim ranges in elevation from 1280 m to 1980 m.

HISTORY

The property was staked as MASS by Welcome North Mines Limited in 1979 and was optioned to Riocanex Incorporated after grab samples of massive sulphide float returned assays of up to 11.4% Pb, 128.2 g/t Ag and 22.8 g/t Au. Vertical loop, VLF-EM, soil sampling, trenching and prospecting surveys in 1980 failed to detect the source of the massive sulphide float. The trench did not reach bedrock and the soil sampling survey was ineffective because of poor soil development. Geophysical surveys outlined a conductive zone beneath the sulphide-rich float, but this was attributed to disseminated pyrite and pyrrhotite (DIAND assessment report 081108). MASS lapsed in 1983, was restaked as GRUMP in June of that year, and was transferred to Giant Yellowknife Mines Limited the following year.

DESCRIPTION

The regional geology of the Nahanni map area is shown by Green and others (1968) and Gordy (1980, 1981). On GRUMP, detailed geology is documented only in a 0.64 km² zone covered by a grid in the southeast corner of the claim block. The northern two-thirds of the grid is underlain by grey-weathering, well-layered dolomite and limestone; possibly lower Paleozoic sediments of the Road River Formation (DIAND assessment report 081108). The southern third of the grid is underlain by monzonite that forms a peripheral phase of the Cretaceous O'Grady Batholith (to the south). A 50 m wide zone of hornfelsed, skarnified and rusty-weathering rocks is present at the irregular contact between the two lithologies. Within this zone are carbonates containing disseminated pyrrhotite (up to 5%) and minor chalcopyrite and sphalerite. Also, there are numerous small boulders of massive arsenopyrite galena - pyrite - chalcopyrite - sphalerite, probably derived from the trench excavated by Riocanex.

CURRENT WORK AND RESULTS

Geological and geophysical surveys were conducted on a 320 m long by 200 m wide grid with wing lines at 40 m intervals and pickets emplaced every 20 m. The baseline azimuth is 070° and its origin is centered on the Riocanex trench.

The geophysical surveys outlined coincident total-field magnetometer, vertical-gradient magnetometer and VLF-EM anomalies over the baseline. Three diamond drill holes were recommended to probe this anomaly, which is considered to be caused by massive or semi-massive sulphides.

Three grab samples of pyrrhotite-rich carbonates were assayed for copper, zinc, gold, silver, lead and arsenic. These contained trace to nil concentrations of all metals except for

one sample which assayed 0.51 g/t Au. Six grab samples of massive sulphide float were collected near the trench. Assays were between 8.23 to 29.49 g/t Au (average 18.6), 7.54 to 147.43 g/t Ag (average 61.4), and 16 to 37% As (average 29%). Three interesting lead assays were obtained (6% to 14%), but all zinc and copper assays were less than 1% (DIAND assessment report 081914).

GRAYLING AND CANOL CLAIMS

Amax Northwest Mining Co. Ltd.	
P.O. Box 12525, Oceanic Plaza	Tungsten
1066 W. Hastings St.	105 O/8
Vancouver, B.C., V6E 3X1	63°16′N, 130°02′W

REFERENCES

Blusson (1974).
DIAND assessment reports: 081622, 081892.

PROPERTY

GRAYLING (314 ha) and CANOL (251 ha).

LOCATION

The claims are on MacMillan Pass adjacent to the Yukon border and are about 170 km north-northwest of Tungsten. They cover the access route across MacMillan Pass to the Mactung Mine.

HISTORY

The claims were recorded in 1981. Work done in 1981 and 1982 included road construction, aerial photography surveys and engineering surveys (DIAND assessment report 081622).

DESCRIPTION

The claims are mainly underlain by undivided, fine-grained Paleozoic clastic sediments that have been folded about east-trending axes (Blusson, 1974).

CURRENT WORK AND RESULTS

Work in 1984 comprised road construction to eliminate switchbacks, improve the entrance from North Canol Road and upgrade the alignment and grade on the mine access road (DIAND assessment report 081892).

COAL LICENCE 156

Petro-Canada Resources Coal	
Coal Division, Box 2844	117 A/9E
Calgary, Alta., T2P 3E3	68°41′N, 136°15′W

REFERENCES

Norris (1981).
DIAND assessment report: 062161.

PROPERTY

Coal Licence 156 (25,628 ha).

LOCATION

The property is on the western edge of the Mackenzie Delta, about 110 km northwest of Inuvik. The western boundary of the property is the Yukon border.

HISTORY

The coal licence was acquired by Petro-Canada in 1981. Between 1940 and 1956 coal was mined from a vertical seam that outcrops near Coal Mine Lake in the northwestern portion of the property. This coal was used for domestic fuel in Aklavik.

DESCRIPTION

COAL LICENCE 156 is included in an area that was mapped at a 1:250,000 scale by Norris (1981). The sediments on the property are part of a series of Cenozoic mollassic wedges that were deposited in the Richards Island Basin. Coal seams are confined mainly to the lower member (Aklak Member) of the early Tertiary Reindeer Formation, which comprises interbedded conglomerate, sandstone, siltstone, claystone and coal deposited in a stream-dominated delta-plain complex. Twenty-one coal seams ranging in thickness from 0.4 m to 4.4 m have been identified within a stratigraphic thickness of 300 m. The aggregate thickness of coal in this stratigraphic section is at least 27 m.

CURRENT WORK AND RESULTS

Work in 1982 comprised plane-table surveying, detailed geological mapping (1:5000) and trenching to establish a preliminary interpretation of the structure, coal quality and resource potential of the Aklak Member on the property. Twenty-one trenches were excavated to expose and sample the coal seams. The exploration demonstrated a low strip-ratio resource potential of more than 500 Mt of high-volatile bituminous B to sub-bituminous A thermal coal.

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CHAPTER 4
ARCTIC ISLANDS REGION

Walter A. Gibbins
District Geologist Arctic Islands

INTRODUCTION

The Arctic Islands Region corresponds to the District of Franklin; it includes the Arctic Islands and Melville Peninsula.

The Arctic Archipelago includes all or parts of several major geological provinces. To the south and east it is bound and in part underlain by Precambrian rocks of the Canadian Shield as exposed in the Minto Arch, the Boothia Uplift, and on Melville Peninsula, eastern Devon Island, Ellesmere Island, and most of Baffin Island (Fig. 4-1).

The north-trending Cornwallis Fold Belt, which divides the Arctic Platform and Franklin Geosyncline into eastern and western parts, developed mainly in Silurian and Devonian time in response to periodic faulting caused by movements of the Boothia Uplift. The Sverdrup Basin, which in late Proterozoic and Mesozoic time was superimposed on the folded Franklin Geosyncline, was itself folded in Cenozoic time. Relatively undisturbed Proterozoic sediments occur in several parts of the Arctic Islands, notably Northern Baffin, Victoria, Somerset and Ellesmere Islands. Comprehensive reviews of the evolution of the Canadian Arctic Islands are given by Thorsteinsson and Tozer (1970) and by Kerr (1981). A volume entitled Geology of the Innuitian Province is being prepared for the Geology Society of America's Decade in North America Geology project and is scheduled to be published in 1987. Summaries of the mineral resources of the Arctic Islands have been prepared by the Geological Survey of Canada (1980a) and by Gibbins (1982 and in press).

The region's two operating mines, Cominco Ltd.'s Polaris mine on Little Cornwallis Island and Nanisivik Mines Ltd.'s mine at Strathcona Sound, northwest Baffin Island, are the two most northerly metal mines in the world. The 1984-1985 production from the two mines is estimated at 90,000 t of lead concentrate and 585,000 t of zinc concentrate. Zinc concentrate from the Nanisivik mine also contains considerable silver by-product (see Chapter 2).

During 1984 and 1985, mineral exploration in the Arctic Islands continued at a relatively high level of activity and expenditure of funds. Some activity took place in all parts of the region (Fig. 4-1). The most notable drop was in coal exploration, which was discontinued in 1984-85 after strong interest in 1980-83 (Gibbins, 1984 and 1985). Major projects that included diamond drilling were: exploration for copper-silver deposits in Natkusiak Formation basalts in the Shaler Mountains of Victoria Island by Panarctic Oils Ltd. (1 in Fig. 4-1); exploration for additional zinc-lead resources in the vicinity of the Polaris Mine, Little Cornwallis Island by Cominco Ltd. (3 in Fig. 4-1); and base metal exploration in the Strathcona Sound area, northwestern Baffin Island, by both Nanisivik Mines Ltd. and Petro-Canada Ltd. (5 in Figure 4-1). During the 1984-85 period, Borealis Exploration Ltd. shifted the direction of exploration on its prospecting permits on Melville Peninsula (6 in Fig. 4-1) from iron to gold.

Smaller exploration projects in 1984 included copper-silver exploration near Hadley Bay, Victoria Island (2 in Fig. 4-1).

In the Cornwallis Lead-Zinc District, Cominco Ltd. conducted an IP survey on Kalivik Island (15 km north-northwest of Polaris), and Tanqueray Resources Ltd. prospected and sampled lead-zinc showings on Baillie Hamilton Island (4 in Fig. 4-1). Nanisivik Mines Ltd. spent one day in 1984 examining showings in a greenstone belt in the Icebound Lake - Mary River area (Jackson, 1978). Petro-Canada Ltd. collected and analysed a few heavy mineral samples from southwestern Ellesmere Island in 1984 and carried out a reconnaissance geochemistry survey in the vicinity of Dewar Lake, west-central Baffin Island (7 in Fig. 4-1).

DIAND's Arctic Island District Geologist continued examinations and studies of areas with potential and known carvingstone resources as part of the Department's on-going responsibilities. The 1984 work included visits to two areas on the Arctic coast near the mouth of Bathurst Inlet. Near Inman Harbor (8 in Fig. 4-1), a large inclusion of soapstone in granite was examined. Near Hope Bay (9 in Fig. 4-1), highly serpentinized peridotites were examined. These peridotites were recognized as the first rocks of komatiitic composition to be reported in the Slave Province (Gibbins and Hogarth, 1986). In the eastern Arctic, a brief reconnaissance was made of mafic and ultramafic meta-igneous rocks near Longstaff Bluff, Baffin Island. In 1985, two well established sources of carvingstone for southern Baffin Island were visited: a serpentine marble site at Aberdeen Bay-Markham Bay (10 in Fig. 4-1) and a serpentinized peridotite-amphibolite at McKellar Bay (11 in Fig. 4-1). The Government of the Northwest Territories Department of Economic Development sponsored the initial use of a non-explosive demolition agent to the Clearwater Fiord carvingstone site (12 in Fig. 4-1).

In August 1985, Dr. Walter Gibbins, Arctic Island District Geologist and Dr. Don Hogarth, Professor of Mineralogy, University of Ottawa visited a mica quarry in pegmatite at Niante Harbor on Cumberland Sound (13 in Fig. 4-1). It has been reported that 14.5 t or $120,000 worth of mica was recovered from this site in 1876 (Milward, 1930 and Blackadar, 1967).

Dr. Laurie Curtis developed a genetic model for the Nanisivik ore deposit, described in a 1984 internal company report. Current research projects concerning the geology and origin of the Nanisivik ore deposits are listed in Table 4-1.

The mineral rights of a large portion of northeastern Ellesmere Island (almost 40,000 km²) were removed in June 1982, by Privy Council order number 1982-1875 as Ellesmere Island National Park Reserve. This includes parts of NTS areas 120 C-F and 340 D, E and H. An assessment of the mineral and hydrocarbon resource potential of this area was recently published by the Geological Survey of Canada (1981a).

In June 1984, representatives of the Government of Canada and the Committee for Original Peoples' Entitlement (COPE),

FIGURE 4-1: Geological provinces of the Arctic Archipelago showing areas of mineral exploration activity, 1984-85.

TABLE 4-1: GEOLOGICAL RESEARCH PROJECTS CURRENTLY UNDERWAY ON THE NANISIVIK ORE DEPOSIT

1. F. Ghazban: Stable Isotopes of the Ore and Host Rocks — to study the conditions of ore formation and the possible derivation of ore-forming fluids — Ph.D., McMaster University.
2. D. Arne: Temperature Variations Between and Within Ore units — to study physical conditions occurring during ore formation — M Sc: Lakehead University.
3. M. Neumann: Geochemistry of the Nanisivik Ore Bodies — to study ore genesis and possible sources. Ph.D.; Heidelberg.

representing the Inuvialuit of the western Canadian Arctic, signed final agreement for land rights settlement. Under this agreement, 13,000 km² (5,000 sq.mi.) of lands, including surface and sub-surface rights were granted to COPE. These are known as 7(1a) lands and are mainly around existing Inuvialuit communities. The surface rights to another 78,000 km² (30,000 sq.mi.) of land, excluding subsurface rights, were also granted to COPE. The subsurface rights for these lands, known as 7(1b) lands, fall under the Canada Mining Regulations, the Canada Oil and Gas Act, etc. However, access to these lands requires that prior notice be given to the Inuvialuit. These 7(1b) lands are mainly in coastal areas of southern Banks Island, western Victoria Island and the adjacent mainland between the Crocker River and the Alaska border (INAC, 1984).

KEY TO FIGURE 4-1

ID	AREA	GEOLOGICAL TARGET	COMMODITY	ORGANIZATION
1.	Northwest Victoria Island	Proterozoic sediments and volcanics of Shaler Group	Copper, silver	Panarctic Oils Ltd.
2.	Hadley Bay, Victoria Island	Proterozoic sediments	Cobalt, copper	Bill Reid
3.	Polaris Mine, Little Cornwallis Island	MVT deposits in Thumb Mountain Fm. dolomite	Zinc, lead	Cominco Ltd.
3.	Kalivik Island	MVT deposits in Thumb Mountain Fm. dolomite	Zinc, lead	Cominco Ltd.
4.	Baillie Hamilton Island	MVT deposits in Thumb Mountain Fm. dolomite	Zinc, lead	Tanqueray Resources Ltd.
5.	Nanisivik Mine, NW Baffin Island	MVT deposit in Society Cliffs Fm. dolomite	Zinc, lead	Nanisivik Mines Ltd.
5.	Elwin Inlet NW Baffin Island	Fault controlled veins in Proterozoic sediments	Silver, barite	Petro-Canada Ltd.
6.	Melville Peninsula	Iron formation	Gold, iron, Zinc, nickel	Borealis Exploration Ltd.
7.	Dewar Lakes	Gold in Pilling Group	Precious metals	Petro-Canada Ltd.
7.	Longstaff Bluff	Meta-mafic and utramafics	Carvingstone	Geology Division DIAND
8.	Inman Harbor	Mafic xenoliths in granite	Carvingstone	Geology Division DIAND
9.	Hope Bay	Serpentinized Peridotite	Carvingstone	Geology Division DIAND
10.	Aberdeen Bay	Serpentinized marble	Carvingstone	Geology Division DIAND
11.	McKellar Bay	Serpentinized peridotite	Carvingstone	Geology Division DIAND
12.	Clearwater Fiord	Altered granite	Carvingstone	GNWT Economic Development
13.	Niante Harbor	Pegmatite	Mica	Geology Division DIAND

Scheduled jet service is available to Resolute Bay, Cambridge Bay, Nanisivik, Frobisher Bay and Hall Beach. Most Arctic settlements have scheduled Twin Otter flights at least once a week. Camp moves and resupply flights for exploration crews are usually by chartered Twin Otters equipped with oversize tires for landing directly on the Arctic tundra. These aircraft are available in Resolute Bay, Frobisher Bay and Hall Beach.

ACKNOWLEDGEMENTS

The author gratefully acknowledges continuing aircraft and logistical support provided by the Polar Continental Shelf Project and their staff, particularly during carvingstone investigations. Numerous carvers, pilots, geologists, company and government personnel and other northerners have greatly assisted the author at various stages of preparing this report.

VICTORIA ISLAND

Victoria Island is underlain by crystalline Precambrian basement rocks, a concordant sequence of comprising clastics, carbonates and gypsum-anhydrite (Table 4-2). A younger unit, the Natkusiak Formation composed of basalt flows and volcaniclastics disconformably overlies the sedimentary rocks of the Shaler Group and follows the axis of the Holman Island Syncline. Closely related to these volcanics are widespread diabase-gabbro sills and dykes (Christie, 1964) that have the same age (650 Ma B. P.), chemical and petrological characteristics as the Coronation sills to the south (Baragar, 1977).

The above mentioned rocks are exposed in a structure called the Minto Arch (Fortier and others, 1963) that dominates the geology of northwestern Victoria Island (1 in Fig. 4-1). Precambrian strata of the Minto Arch form a northeast trending synform, named the Holman Island Syncline (Figs. 4-2 and 4-3), however, the Minto Arch became a positive topographic

feature during the Paleozoic. It underlies most of the Diamond Jenness Peninsula, the Saneraun Hills and the Shaler Mountains (Fig. 4-2).

"The angular discordance between the lower Palaeozoic and the Precambrian rocks of the Minto Arch demonstrates that the Walker Bay Anticline and the Holman Island Syncline were folded prior to deposition of the earliest Palaeozoic rocks in the area. Later crustal movements, however, are clearly responsible for the present position of the Minto Arch as a structural high, or uplift, with homoclinal sequences of Palaeozoic rocks dipping away from the Arch. There is no evidence in the stratigraphic column of the map-area to suggest that the Minto Arch underwent sudden uplift at any time. The essentially homoclinal sequence of Upper Cambrian(?) to Upper Devonian strata that extends through Prince Alberta Peninsula into northeast Banks Island presumably developed as a result of the positive movement that effected the Minto Arch. The uplift is, therefore, presumably Upper Devonian or later. Lower Cretaceous rocks rest unconformably upon the Palaeozoic strata and this suggests that the uplift of the Minto Arch took place prior to the Lower Cretaceous.

The Boothia Arch, east of the map-area, is known to have moved positively, and relatively violently, in late Silurian to early Devonian time. Latest Silurian and early Devonian rocks are not exposed on Victoria Island; consequently there is no record of events for this period. It is conceivable that the Minto Arch moved in late Silurian or early Devonian time (i.e., at the time of movement of the Boothia Arch), but this is improbable" (Thorsteinsson and Tozer, 1962, p. 72).

TABLE 4-2: TABLE OF FORMATIONS, VICTORIA ISLAND

QUATERNARY	
18	Areas of thick glacial drift; mainly morainal; outcrops of bedrock are very scarce.
	Unconformity
ORDOVICIAN	
12	BLUE FIORD FORMATION: limestone shale.
SILURIAN	
11	READ BAY FORMATION: limestone dolomite, shale.
CAMBRIAN? ORDOVICIAN AND SILURIAN	
10	10a, Cambrian? sandstone, minor shale, siltstone, dolomite; 10b, Ordovician and Silurian, dolomite, minor chert, shale, sandstone.
	Unconformity
LATE PRECAMBRIAN	
9	Gabbro dykes and sills; sill not mapped.
8	NATKUSIAK FORMATION: basalt flows; minor aggolmerate.
	Low angle unconformity
	SHALER GROUP (3-7c)
7c	KUUJJUA FORMATION: mainly coarse grained quartz sandstone, minor conglomerate and limestone.
7b	UPPER KILIAN FORMATION: Sabkha-environment red and tan shaly limestone, grey sabkha carbonates with gypsum beds, and red siltstone.
7a	LOWER KILIAN FORMATION: varicoloured evaporitic mudstone and bedded bypsum/anhydrite.
6	WYNNIATT FORMATION: limestone; minor dolomite, shale, sandstone.
5	MINTO INLET FORMATION: gypsum, anhydrite, minor sandstone, limestone, shale, dolomite; siltstone.
4	REYNOLDS POINT FORMATION: limestone, sandstone; minor siltstone, shale.
3	GLENELG FORMATION: sandstone, limestone, sandstone, dolomite, conglomerate.
	Unconformity
2	HADLEY BAY FORMATION: Quartzite, sandstone, rare conglomerate and dolomite.
	Unconformity
1	Pink, coarse grained granodiorite

NORTHWEST VICTORIA ISLAND RECONNAISSANCE

Panarctic Oils Ltd.	Copper, Silver
P.O. Box 190	77 G/13; 78 B/14;
Calgary, Alta., T2P 2H6	87 E/13, F/16, G/1,
	H/3,4,7,9,10,15,16;
	88 A/1
	70°52'-72°08'N,
	111°30'-116°30'W

REFERENCES

Baragar (1976, 1977): Baragar and Loveridge (1982); Christie (1964); Jefferson (1985); Jefferson and others (1985); Newbury (1969); Palmer and Hayatsu (1975); Thorpe (1972); Thorsteinsson and Tozer (1962).

DIAND assessment report: 081858.

PROPERTY

Twenty-six prospecting permits (974-997, 1075 and 1076) encompass 643,120 ha.

LOCATION

The permit areas cover most of the volcanic rocks of the Natkusiak Formation of northwestern Victoria Island (Fig. 4-2). The permits can be divided into two groups. The southwest block, ten permits, occupies the central core of Diamond Jenness Peninsula, immediately south of the Kuujjua River. The second group (16 permits) includes most of the northeast-trending Saneraun Hills and Shaler Mountains (Figs. 4-2 and 4-3). The area is 50 to 275 km northeast of Holman Island and an average of 425 km northwest of Cambridge Bay, the only established communities on Victoria Island. However, the Panarctic Oils Ltd. mineral camp was resupplied by Twin Otter STOL aircraft from their base at Rea Point, Melville Island, 500 km to the northeast.

HISTORY

The occurrence of copper on Victoria Island was first reported by V. Steffanson in 1913 on the basis of reports given to him by Inuit in Prince Albert Sound. However, Thorsteinsson

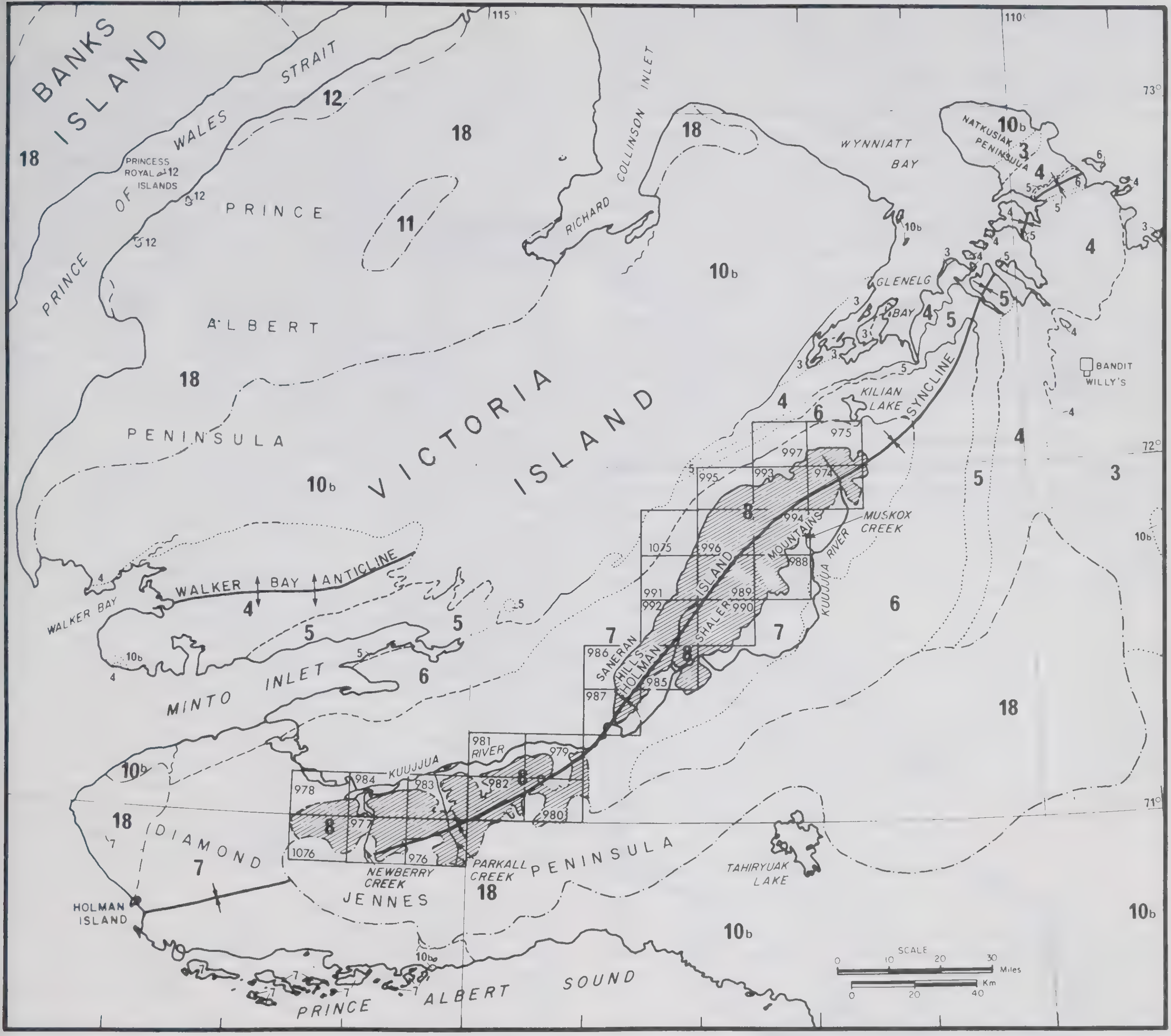

FIGURE 4-2: Map of Precambrian geology and permit areas, northwestern Victoria Island, modified (from Thorsteinsson and Tozer, 1962). See Table 4-2 for legend.

and Tozer (1962, p. 77) were the first people of European origin to observe copper ('a few small flecks and flakes') "in situ" in the volcanic rocks of the Natkusiak Formation.

During 1968-70, copper exploration in the Coppermine River area 'spilt over' to Victoria Island as the Muskox Syndicate, Grandroy Mines Ltd. and the M.J. Boylen Engineering Co. Ltd. prospected and explored the Natkusiak Formation for copper. Numerous copper showings were discovered and limited mapping, drilling and geophysics were done in an attempt to delineate the economic potential of some of the best showings. Many of the initial targets were vein-type deposits, associated with a series of north-trending faults that transect the Proterozoic section (Thorpe, 1972, p. 141-145).

In 1982, a four-person crew of Panarctic Oils Ltd. geologists collected stream water and stream sediment samples that were assayed for uranium, copper, silver, gold, nickel, iron and/or chromium (Gibbins, 1985). They also examined four areas of known copper showings. Four main types of copper-silver showings were recognized in these areas; a) vein type - mainly massive chalcocite with minor native copper, b) vesicule and void fillings vesicular and pyroclastic basalts, c) fracture fillings - similar but narrower than veins, and d) disseminated copper minerals in massive or pyroclastic basalts. The fracture fillings are commonly malachite and/or azurite smears along fracture planes. They occasionally have high silver and several spectacular pieces of native copper have been obtained from them.

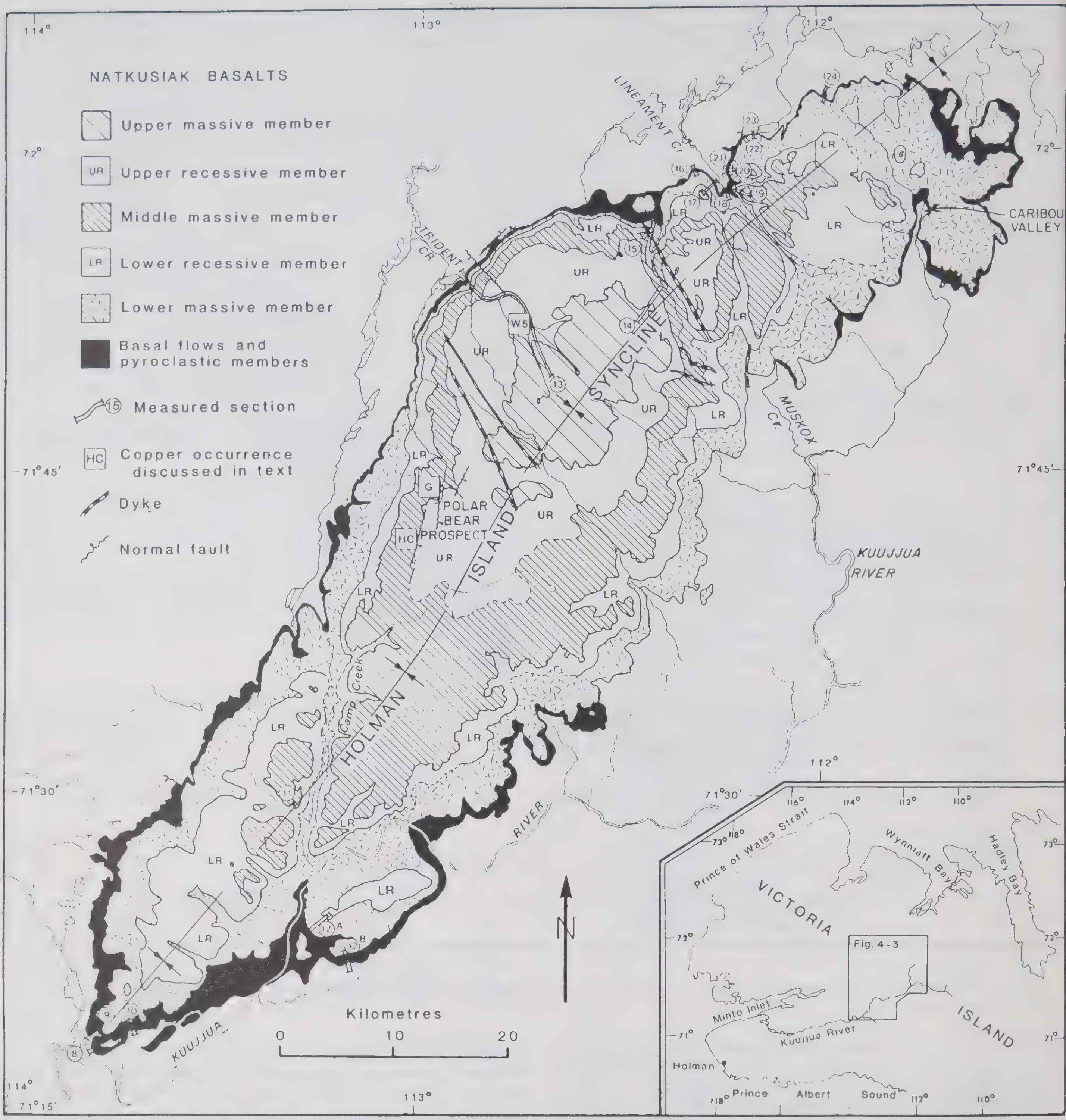

FIGURE 4-3: Geological map of Natkusiak basalts in the Northeast sector of Holman Island Syncline. Copper occurrences are shown by letter (W5, G, HC). Numbers refer to measured sections (from Jefferson and others, 1985).

Panarctic Oils Ltd. acquired Prospecting Permits 974 to 997 on February 1, 1983, and 1075 and 1076 in 1985.

In 1983, several hundred stream sediment samples were collected and analyzed to complete coverage of the area. A total of 16 copper-silver anomalies were outlined and followed up with prospecting and geological mapping. The area around the W-5 showing (Trident Creeks area), which had been discovered and drilled by the Muskox Mines Syndicate in the late sixties (Thorpe, 1972, p. 142), was prospected. Finally, a stratigraphic cross-section of lithologies and units in the Natkusiak Formation volcanics was established.

DESCRIPTION

The Natkusiak Formation, as defined by Thorsteinsson and Tozer (1962, p. 37) is a sequence of volcanic rocks that consists of dark-coloured, basaltic flows and pyroclastic sediments. This formation rests disconformably on the Kuujjua and Kilian Formations of the Shaler Group and includes the youngest Precambrian layered rocks in the area. The Natkusiak Formation is confined to Victoria Island, where it is exposed in two detached belts along the axis of the Holman Island Syncline. Landsat images clearly show a series of northwest-trending fractures that extend great distances into the Paleozoic sediments.

The formation is named for Natkusiak, late resident of Holman and well-known travelling companion of Arctic explorer Vilhjalmur Steffansson. Natkusiak's grave is in the Holman cemetery. The type section of the Natkusiak Formation is some 25 km south of Glenelg Bay, northern Victoria Island.

The formation attains a maximum thickness of about 300 m at about longitude 112º30'W. Where individual flows have been recognized, they are about 30 m thick. Amygdules commonly characterize the lower and upper parts of flows, whereas the middle section is dense basalt. Red and green agglomerate, commonly poorly indurated and cut by thin veins of calcite, is locally present at the base of the formation and ranges to 100 m in thickness. The agglomerate comprises fragments of volcanic rocks, bombs, and baked sedimentary rocks of various types that are embedded in a matrix of calcite and tuff. The volcanics are commonly chloritized and epidotized.

Baragar (1976 and 1977) measured several sections of Natkusiak Formation volcanics for detailed geochemical and paleomagnetic studies. He related them to the Franklin magmatic province (or Franklin Magnetic Interval) of late Hadrynian time (i.e., circa 600 Ma B.P.). They are the only known surface eruption of this event that also includes the Coronation dolerite sills and sheets (Christie, 1964) and the Franklin diabase dykes.

The late Hadrynian age assumed for the magmatic rocks is based upon a K-Ar age determination of 640 Ma for one of the sills reported by Christie (1964) and a K-Ar isochron age of 625 Ma determined for the basalts of Palmer and Hayatsu (1975). Confirmation of these ages by the Rb-Sr isochron technique was attempted. Unfortunately, the Rb/Sr ratios in the dolerites are uniformly low with limited spread. They cluster about a 2.2 Ga reference isochron (Baragar and Loveridge, 1982). However, an age of 2.2 Ga is geologically unreasonable. This result is thought to reflect contamination of late crystallizing fractions of the magma by solutions from Archean basement, through which the magma passed. A 'secondary' isochron indicating 384 Ma is also unexplainable, but may be due to contamination or post-Devonian uplift.

"The Natkusiak basalts are typical plateau basalts which have erupted, for the most part, in a subaerial environment. Each flow comprises a massive base, with the exception of a thin amygdaloidal zone at the bottom, and highly amygdaloidal top. The top ranges from 1/4 to 1/10 the thickness of the flow, although some thin flows are almost entirely amygdaloidal. Most flows have a pronounced 'sheeting' structure which is parallel or subparallel to their contacts, and is most closely-spaced at their tops. Weathering of the sheeted basalts is commonly severe. The thinner flows are sheeted throughout and the attendant weathering makes a fresh sample difficult to obtain. In the thicker flows, the lower portion is generally unsheeted and fresh. Almost certainly the sheeting structure is inherited from a primary feature such as flow layering, but it has been much modified by weathering and produces a very friable rock" (Baragar, 1976, p. 350).

The Natkusiak Formation contains copper-bearing flood basalts similar to those of the Coppermine River area and the Keeweenawan Peninsula of Upper Michigan. Reconnaissance prospecting in the late sixties resulted in the discovery of more than 100 showings of chalcocite, bornite, malachite, azurite, chalcopyrite and native copper (Thorpe, 1972, p. 142).

Newbury (1969) studied the copper showings of claims on the southwestern block of Natkusiak Formation (Diamond Jenness Peninsula). He described epigenetic native copper in permeable zones, prehnite-bearing vugs, amygdules and fractures. Chalcocite apparently formed at a water table from vadose copper-bearing fluids.

Jefferson and others (1985) subdivided the Natkusiak Formation into six litho-stratigraphic members (Table 4-3). Jefferson (1985) defined a sixth, uppermost unit of the Shaler Group, the Kuujjua Formation. The Kuujjua Formation is a distinctive quartzarenite that is restricted to the southwest half of the Holman Island Syncline area. It unconformably overlies the Kilian Formation and is in turn unconformably overlain by the Natkusiak Formation.

Jefferson (1985) also noted that the evaporites, sabkha limestones and dolostones of the upper Kilian Formation are lithologically similar and time equivalent to the Thundercloud Formation of the Mackenzie Mountains. However, evaporites and red alluvial mudstones of the Redstone River Formation, which overlies the Thundercloud Formation, appear to have no counterparts on Victoria Island. In addition, there are several other variations in the geology of the two areas (Jefferson, 1985, p. 108-109).

CURRENT WORK AND RESULTS

1984

A 10-person crew spent the 1984 field season examining 20 areas of stream sediment geochemical anomalies; work included measuring and mapping across several stratigraphic sections and prospecting. Numerous mineral showings were discovered and have been classified into several distinct types (Table 4-4). Detailed work was concentrated in two areas; Trident Creek area and Polar Bear Prospects area, both of which lie along the western side of the northern block of Natkusiak Formation (Fig. 4-3)

Trident Creek Area: Consultant John Reedman mapped and prospected 180 km² of the Trident Creek area (W-5 in Fig. 4-3), where the Muskox Mines Syndicate had explored and drilled the W-5 showing in the late sixties. A number of copper showings were discovered and sampled. Assays of 121 river-gorge-talus samples ranged from 34 to 2,000 ppm Cu and showed an erratic distribution when plotted on a base map. No further work at the W-5 showing was recommended because copper is restricted to narrow chalcocite veins (type 4 of Table 4-4) which are found along minor northwest-trending fractures and are discontinuous along strike and dip, and to small disseminations of native copper of limited extent in flow tops (type 3). However, talus and felsenmeer sampling over a larger region

TABLE 4-3: STRATIGRAPHY OF THE NATKUSIAK FORMATION, VICTORIA ISLAND (from Jefferson and others, 1985).

Formation	Member (Thickness)	Lithology
DYKES (cm to dm wide)		Massive jointed diabase. Intrude entire Shaler Group and Natkusiak basalts. Two orientations, NE and NW.
SILLS (O to >60 m thick)		Massive, columnar-jointed diabase: locally well developed internal layering, cumulate textures and granophyre. Intrude mainly Shaler Group, thin sills in basalts.
NATKUSIAK BASALTS	UPPER MASSIVE ($\geq$150 m)	4-8 flows: blue-green, orange-brown weathering, massive blocky to columnar jointed. Forms top plateau in Trident Creek area.
(>1100 m, 40-50 flows)	UPPER RECESSIVE ($\leq$500 m)	20-29 flows: dark green, mainly green-brown weathering, rubbly flaggy breaking.
	MIDDLE MASSIVE (80-90 m)	4-6 flows: blue-green, orange-brown weathering, massive blocky to columnar jointed, forms top plateau throughout much of region.
	LOWER RECESSIVE (20-200 m)	4-9 flows: dark brown-green to green, drab green-brown weathering. Locally includes pyroclastic rocks and pillowed lavas.
	LOWER MASSIVE (~75 m)	2-5 flows: blue-green to green-grey, orange-brown to brown weathering, massive, cliff-forming, blocky to columnar jointed, forms second lowest plateau.
	PYROCLASTIC (0- >100 m)	Lower ~10 m: locally sedimentary, green to maroon, upper $\leq$90 m: lithic lapilli tuff, local tuff-breccia, green (bottom) to maroon (top).
	BASAL (0- >70 m)	0-4 flows, blue-green to green-brown, orange-brown to green-brown weathering, massive, cliff-forming to rubbly. Locally spheroidally weathered or includes hyaloclastic breccia with lithic and volcanic inclusions; isolated to layered pillowed flows in amygdaloidal hyaloclastic matrix. Forms plateau in central and southwestern areas.
	LOW-ANGLE UNCONFORMITY	
SHALER GROUP		

TABLE 4-4: COPPER OCCURRENCES AND ALTERATION, NATKUSIAK BASALTS AND UPPER KILIAN FORMATION (from Jefferson and others, 1985).

Type	Mineral	Host Rock	Associated Minerals[1]	Shape of Occurrence
1A	Native Copper (disseminated)	densely amygdaloidal parts of flows, any member	prehnite, quartz, chlorite, pumpellyite, calcite.	disseminated within amygdules and gas cavities, at junctions between prehnite crystals and fine wires and blebs within botryoidal masses of prehnite.
1B	Native Copper (disseminated)	middle and upper massive members: as 1A but with associated red interflow mudstones	prehnite, pumpellyite, chlorite, quartz, calcite; similar alteration in red mudstones.	thin veinlets in joints, disseminated in amygdules and in massive basalt, minor copper in veinlets and reduction spheres in red mudstones.
2	Native Copper (veins)	massive jointed flows with knobby, sparsely amygdaloidal texture	microscopic prehnite-pumpellyite-quartz	crystalline dendritic copper in the shape of blebs, and thin to thick veins along joints.
3	Native Copper (disseminated)	massive flows, any member	none (other than typical whole rock alteration)	disseminated fine to microscopic flecks in massive basalt.
4	Chalcocite (bornite, tetrahedrite, pyrite) (veins)	recessive members (mainly)	quartz, calcite, hematite, chlorite, pumpellyite	veins and vein-sets, commonly trending 120-130°, expanding laterally in amygdaloidal flow tops.
5	Pyrite, chalcopyrite (±arsenopyrite)	pyroclastic member	not known	very fine grained, disseminated in matrix and outlining clasts; locally forms massive clasts.
6	Chalcocite (veinlets)	upper Kilian, cream limestone member	none documented	steeply dipping veinlets near overlying Natkusiak basalts.

[1] Associated minerals listed approximately in order of decreasing proximity to copper, minor minerals in brackets.

to identify very large targets like extensively mineralized flows was recommended. The Trident Creek area contains the thickest section of the Natkusiak Formation.

Polar Bear Prospects: This area is west of the center of the northern block of Natkusiak Formation and contains geochemical anomalies 4 and 5 identified during the 1983 field season. In 1984, surface prospecting was carried out along lineaments and areas of geochemical anomalies, and 65 additional geochemical samples were collected in areas of high copper potential. Numerous types of copper showings were found. Clearly the most important discoveries were the Holy Cow and Genesis showings, where spectacular veins of native copper fill vertical to near vertical fractures in the middle massive basalt members.

> At the **Genesis showing** (G in Fig. 4-3) types 1B and 2 native copper occur within the top flow of the middle massive member. (This) flow top is altered extensively to chlorite-pumpellyite and transected by numerous quartz-prehnite veinlets containing late calcite. Some of these veins also extend up into the recessive flow. Native copper is disseminated throughout the flow top and concentrated near the veined zones. One of the veins, up to 40 cm wide and trending 130º, cuts deeper into the underlying flow and consists of native copper disseminated in prehnite, quartz, chlorite and pumpellyite. Late sparry calcite fills large voids. The veins preferentially fill the 035º-050º oriented portions of polygonal columnar joints in the massive basalt (Jefferson and others, 1985, p. 212).

At the **Holy Cow showing** (HC in Fig. 4-3), similar veins strike approximately 125º and also fill triple junctions between polygonal joints. Pieces of native copper from exhumed veins range from 1 to 300 kg weight (Fig. 4-4) and assay as high as 98.4% copper and 70 ppm silver (Jefferson and other, 1985, p. 211).

Camp Valley Area (Fig. 4-3): This area corresponds to geochemical anomaly 2 where a number of stream sediment samples anomalous in copper and gold had been identified in the 1983 work. In 1984, a grid was established and orientation soil geochemistry and VLF-EM surveys were done.

Lineament Creek Area (Fig. 4-2): Geochemical anomaly 3 contains very fine-grained chalcopyrite-pyrite in matrix and clasts of lapilli tuff. This is also known as the Fault Creek area.

Newbury Creek Area (Fig. 4-2): This area corresponds to anomaly 6 of the 1983 geochemical survey and an area of copper showings examined by Grandroy Mines Ltd. in 1968 (Newbury, 1969). A number of copper showings were discovered, including disseminated native copper in flow tops and massive basalts, replacement chalcocite in vesicular basalt and native copper in a basaltic flow in the lower recessive member of the Natkusiak Formation. This unit, a 'mega-amygdaloidal' basalt flow, is found in an extensive area on the east side of Newbury Creek. It contains mega-amygdules, 10 to 50 cm in diameter, filled with prehnite, silica, wall-rock, native copper and malachite.

Parkall Valley Area (Fig. 4-3): This area contains the thickest section of the volcaniclastic member of the Natkusiak Formation. Both silver (7) and copper (8-9) geochemical anomalies are found in an area of pyroclastics.

1985

During June and July 1985, 17 holes (396.3 m) were drilled in the Parkall Valley area (southeast corner of Prospecting Permit 983) and the Newbury Creek area (south central Prospecting Permit 984).

FIGURE 4-4: Massive copper plates at Holy Cow showing.

Newbury Creek Area - PP 984: Eleven holes (300.9 m) tested a series of horizontal zones of chalcocite - native copper-malachite-prehnite-quartz-calcite minerals. These zones are parallel to horizontal flow banding in the Lower Recessive Member of the Natkusiak Formation.

All but three holes, abandoned in permafrost, reached their targeted depths without encountering significant copper minerals. Only scattered grains of copper and occasional veinlets of chalcocite were encountered.

Parkall Valley - PP 984 and 977: Six holes (95.7 m) tested a series of vertical chalcocite veins and veinlets in the Volcaniclastic Member of the Natkusiak Formation. These veinlets are associated with light green zones of alteration to bentonite. This bentonite alteration caused problems in core drilling and forced 4 of the 6 holes to be stopped short of the main target and produced inconclusive results.

WILLY'S AND BANDIT CLAIMS

William Reid	Copper, Cobalt, Silver
P.O. Box 56	78 B/7
Yellowknife, NWT X1A 2N1	72º15'N, 109º30'W

REFERENCES

Christie (1964): Thorsteinsson and Tozer (1962).
DIAND assessment report: 081833.

PROPERTY

WILLY'S and BANDIT claims.

LOCATION

The claims are on northern Victoria Island, 350 km north of Cambridge Bay, 30-35 km west of Hadley Bay and 25 km south of the Natkusiak Peninsula (2 in Fig. 4-1 and upper extreme right in Fig. 4-2).

HISTORY

The copper-silver gossans were first observed from the air in the summer of 1981. The following summer, WILLY'S and BANDIT claims were staked and recorded by William Reid of Yellowknife.

Ida Point Minerals Ltd. and Noranda Exploration Ltd. geologists made brief field examinations in 1981 and 1982 respectively.

DESCRIPTION

The claims are underlain by Glenelg Formation, the basal member of the Proterozoic Shaler Group (Table 4-2). The Glenelg Formation is mainly flat-lying quartz-rich sandstone with minor stromatolitic dolomite and siltstone (Thorsteinsson and Tozer, 1962). Prominent diabase and gabbro dykes and sills, that characterize the Precambrian terrain of Banks and Victoria Islands (Christie, 1962), are well developed in the claim area (Fig. 4-5).

Several areas of obvious gossan are present in the claim area. However, the most spectacular is an area of black gossan 2.5 km north of 'Willy's Lake' near the centre of the BANDIT claim (Fig. 4-5). It consists of a flat mound of loose pyrite sand and alteration products about 100 m across and 3 to 4 m high (Fig. 4-6). The alteration products are mainly iron oxides and sulphates. Pale green to aquamarine melanerite, $FeS0_4 \bullet 7H_20$, was found a few centimetres below the surface. A strong sulphide odour is present and solutions draining from the black gossan have produced a large brown iron stain on dolomite in the adjacent creek bed. The black gossan has all the appearances of an extinct mineralized geothermal system, but samples of the black gossan usually contain less than 0.10% Cu.

Numerous yellow to red to orange-brown gossans are also present in a 10 by 5 km area. The sulphide minerals may occur as veins (usually in dolomite units), or disseminated in more permeable sandstone. Two relatively important copper showings are found in sandstone, less than 250 m west of the black gossan, and on the west side of the north arm of Willy's Lake, 3 km south of the black gossan. Grab samples from these showings ranged from 0.040 to 0.575% Cu, 40 to 300 ppm Co and 0.34 to 35.3 g/t (ppm) Ag. Assays for gold are low, normally less than 0.10 g/t Au.

Chalcopyrite and chalcocite are the two principal copper minerals. They are usually accompanied by pyrite and secondary malachite and/or erythrite or 'cobalt bloom'. Well formed hexagonal crystals of specular hematite can be found lining vugs.

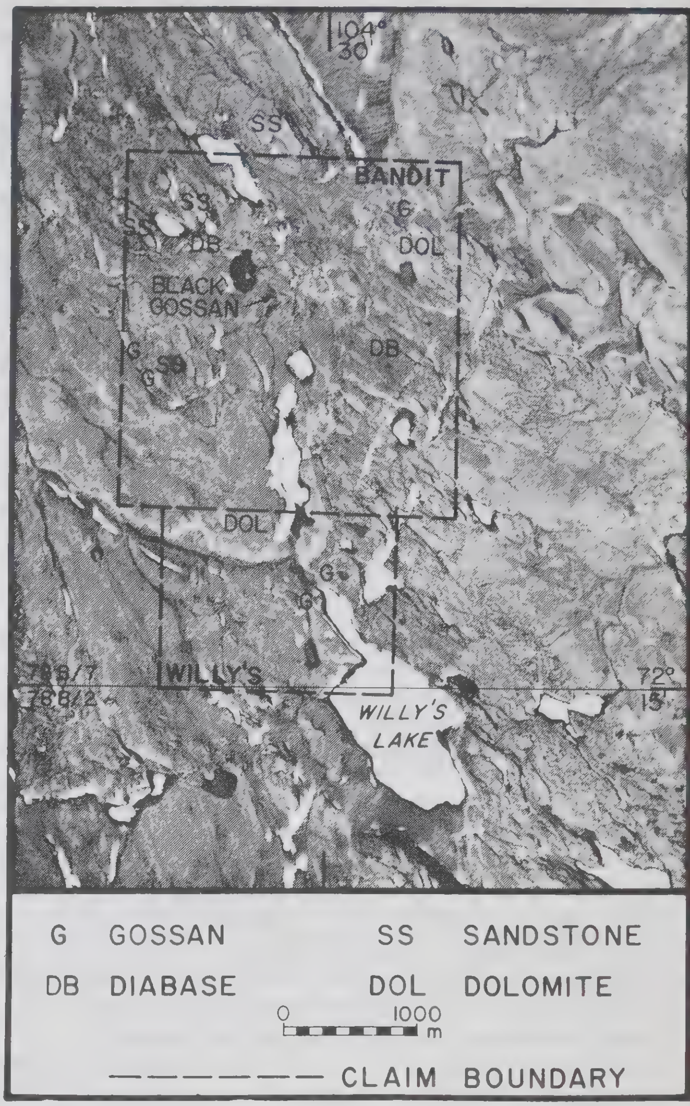

FIGURE 4-5: Geology of WILLY's and BANDIT claims, northeast Victoria Island.

CURRENT WORK AND RESULTS

In August 1984, numerous small pits were made in the area and samples were collected for assay.

CENTRAL ARCTIC: CORNWALLIS LEAD-ZINC DISTRICT

The Cornwallis Lead-Zinc District (Fig. 4-7) was controlled by the same tectonic elements that formed the Cornwallis Fold Belt, which is a major structural feature of a steep-sided anticlinorium of Proterozoic to Devonian formations (Table 4-5) that overlies a basement horst (Kerr, 1977a and 1977b). The deformation in the Cornwallis Fold Belt can be attributed to several pulses of differential vertical uplift of the underlying Boothia Horst. It was formed mainly by the Cornwallis Disturbance, which consisted of four main pulses or cycles that began with uplift and erosion of the fold belt and was follow-

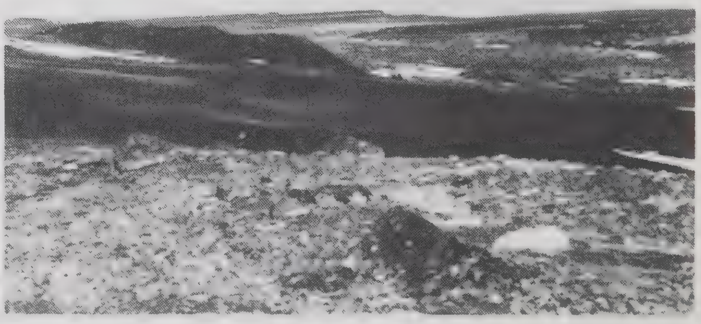

FIGURE 4-6: Photo of black gossan, BANDIT claim.

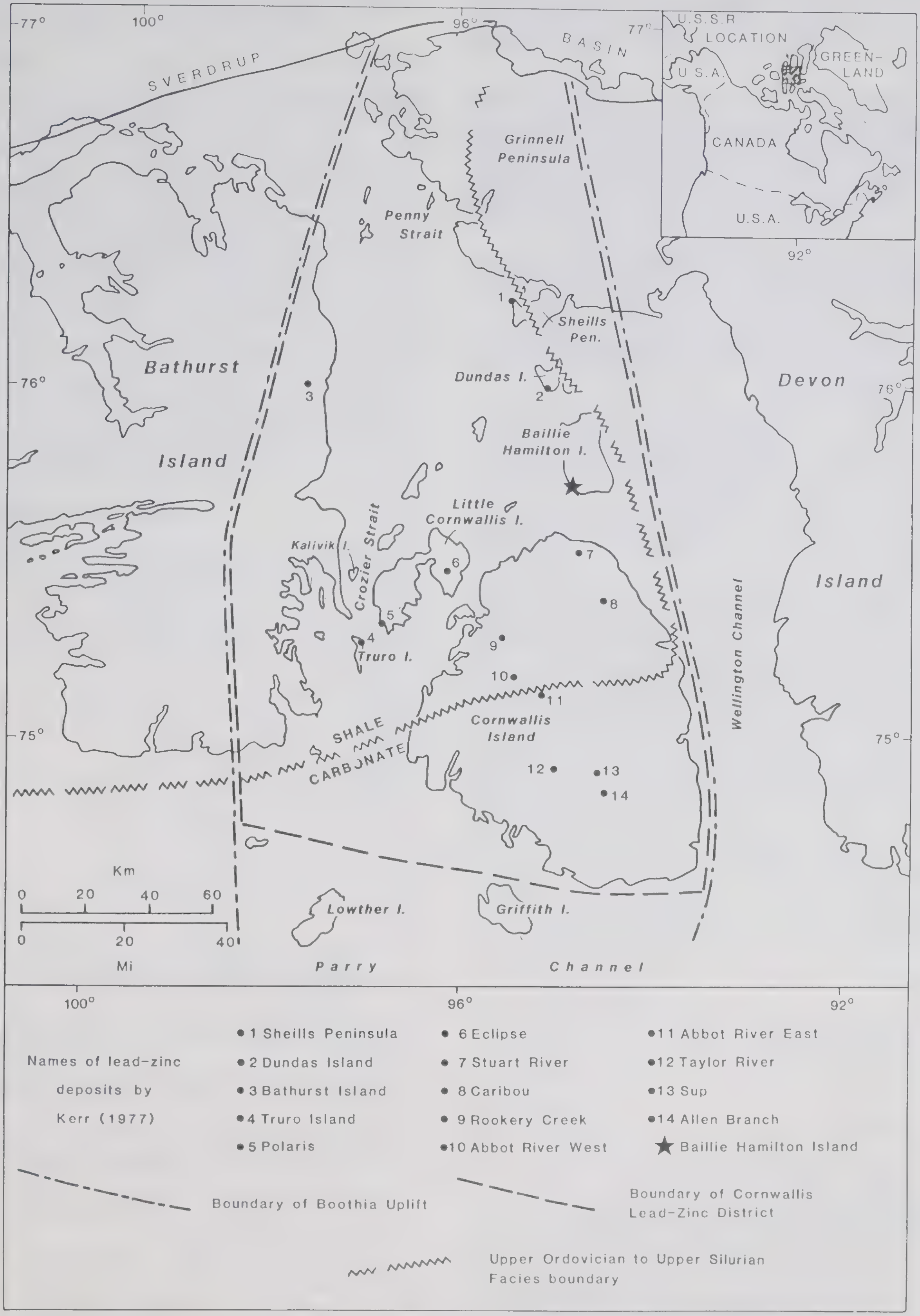

FIGURE 4-7: Index map of the Cornwallis Lead-Zinc District (from Kerr 1977b and Thorsteinsson, 1984).

ed by broader regional subsidence and resumption of deposition (Kerr, 1977a). The Cornwallis Disturbance lasted from Early Silurian to Late Devonian. Each uplift or tectonic pulse is marked by a regional unconformity of varying local significance (Table 4-5).

The Cornwallis Fold Belt is centered at Resolute Bay in the Central Arctic of Canada. The northern half coincides with the Cornwallis Lead-Zinc District of Kerr (1977b) and includes all of Cornwallis Island and Little Cornwallis Island, the eastern margin of Bathurst Island and the west and central two-thirds of the Grinnell Peninsula of northwestern Devon Island (Fig. 4-7).

In addition to establishing the geological framework of the region, Kerr (1977a, 1977b) outlined four probable controls on mineralization (Table 4-6) that are remarkably consistent with regard to lead-zinc deposits and prospects in the region, including the large, high-grade Polaris deposit. The region has been mapped geologically by Thorsteinsson and Kerr (1968) and Thorsteinsson (1973).

The Cornwallis Lead-Zinc District of the Central Arctic was the scene of continued mineral exploration in 1984, as Cominco Ltd, did IP surveys at Kalivik Island, 20 km north-northwest of the Polaris Mine, at the Eclipse property 30 km northeast of Polaris and in the area immediately south of the mine.

Tanqueray Resources Ltd. prospected and sampled prospecting permits areas on Baillie Hamilton Island, 7.5 km northeast of Polaris (Figure 4-7).

At the Polaris Mine (see Chapter 2), continuous surface and underground exploration drilling (nearly 13,000 m) increased the total and measured reserves of ore by 18% or 3.1 Mt (Cominco Ltd. Annual Report, 1984). However, in 1985, exploration decreased with falling zinc prices and drilling at the mine accounted for virtually all of the exploration in the area. This drilling, along the east side of the Keel ore zone, completed the definition of the main orebody.

In 1984, 120 holes (12,800 m) were drilled at Polaris, compared with 80 holes (9,200 m) in 1985.

KAL and VIK CLAIMS

Cominco Ltd. — Zinc, Lead
1700-120 Adelaide St. — 68 H/10
Toronto, Ontario, M5H 1T1 — 75°31′N, 97°15W

REFERENCES

Kerr (1977a, and 1977b).
DIAND assessment report: 082053.

PROPERTY

KAL and VIK.

LOCATION

The claims include all of Kalivik Island, a small island less than 10 km² that lies near the centre of Crozier Strait (Figure 4-7). Kalivik Island is 5 km west of Royale Point and 15 km north-northwest of the Polaris Mine, both on Little Cornwallis Island. The closest community is Resolute Bay, 120 km to the southwest.

Kalivik is an Inuktutut word that means ‘place to drag things to’.

TABLE 4-5: STRATIGRAPHY AND TECTONIC EVENTS OF THE CORNWALLIS LEAD-ZINC DISTRICT (from Kerr, 1977b).

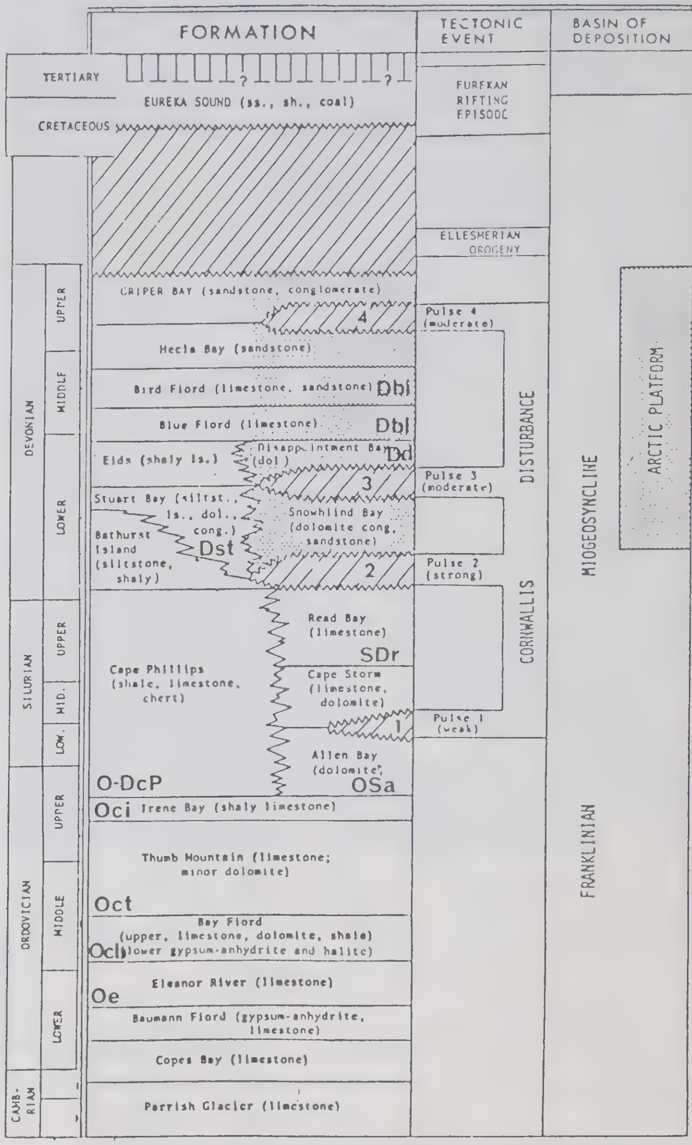

TABLE 4-6: CONTROLS ON MINERALIZATION IN THE CORNWALLIS LEAD-ZINC DISTRICT (from Kerr, 1977b).

(1) the host is the upper bioclastic part of the Ordovician Thumb Mountain Fm. (12 of 15 showings, the other 2 are also in carbonate).

(2) the host rock is locally brecciated dolomite (15 of 15 showings, sparry dolomite veining known as pseudobreccia is common).

(3) the showings lie within the bounds of the Cape Phillips shale basin and structurally higher than the shale (11 of 15 showings, the Cape Phillip shales may be a source of the metals).

(4) the host is overlain unconformably by the Disappointment Bay Fm., (Pulse 3 in Table 4-5), (7 of 8 showings, one is in the Disappointment Bay and 6 are unknown).

HISTORY

The claims were staked in the spring of 1983.

DESCRIPTION

Kalivik Island is a small island with low topographic relief. Frost-shattered felsenmeer surface exposure suggests that it is mainly underlain by Devonian Disappointment Bay Formation. These rocks comprise bedded, vuggy, porous, bituminous dolomites with horizontal to westerly dipping attitudes. Because the basal chert-chip conglomerate is not exposed, it is impossible to determine the local thickness of the Disappointment Bay Formation or confirm that the Thumb Mountain Formation underlies it. Red, fine-grained, dolomitic sandstone along the southeast coast may be Snowblind Bay Formation.

Kalivik lies well within the Cornwallis Fold Belt and Cornwallis Lead-Zinc District (Kerr, 1977a and 1977b) and, as far as can be determined, it meets at least two of Kerr's controls on mineralization (Table 4-5). It lies within the bounds of the Cape Phillips Formation shale basin (Fig. 4-7) and is overlain by Disappointment Bay Formation.

CURRENT WORK AND RESULTS

In 1984, a combined induced polarization (IP) and resistivity survey was carried out on Kalivik Island, including 13 km of reconnaissance and 1 km of detailed survey. Remnant salt from sea water in permafrost and poor ground contact adversely affected the resistivity survey; however, the chargeability results are not affected by permafrost or salt content. The reconnaissance IP survey identified, and detailed work confirmed, a zone of high chargeability readings. The most likely source is disseminated metallic sulphide minerals 100 to 200 m below the surface.

Geological investigations were recommended, but it is not know if they were undertaken.

PROSPECTING PERMITS 1008-1010

Tanqueray Resources Ltd.	Lead, Zinc
100, 625-4th Avenue S.W.	58 G/14
Calgary, Alta., T2P 0K2	75º52'N, 94º30'W

REFERENCES

Kerr (1977a and 1977b); Throsteinsson (1984, 1973); Thorsteinsson and Kerr (1968).

DIAND assessment report: 082054.

PROPERTY

Prospecting Permits 1008-1010.

LOCATION

The three prospecting permits include all of Baillie Hamilton Island except for the northeast coast. Baillie Hamilton Island is 120 km north of Resolute Bay, the transportation hub of the central Canadian Arctic (Fig. 4-7).

HISTORY

The permits were granted by the Department of Northern Affairs, February 1, 1984.

DESCRIPTION

Baillie Hamilton Island is part of the cratonic Boothia Uplift (Cornwallis Fold Belt of Kerr, 1977a) and falls within the Cornwallis Lead-zinc District of Kerr (1977b) (Fig. 4-7). The local geology was mapped by Thorsteinsson and Kerr (1968) and revised by Thorsteinsson (1973 and 1984 - see Fig. 4-8).

> The strata exposed on Baillie Hamilton Island are divisible into two structurally conformable sequences separated from one another by an angular unconformity (Fig. 4-8). The older sequence includes the Cape Phillips Formation and overlying Sophia Lake Formation. These formations outcrop in eastern parts of Baillie Hamilton Island, and together they constitute surface exposures for over more than three quarters of the island. The regional strike of these formations is northerly, and they generally dip eastward. The younger sequence is made up of the Disappointment Bay Formation and an overlying unnamed limestone unit. These formations occupy a narrow strip of territory along the west side of the island. The regional strike and dip of these rocks are north and west, respectively. Both the older and younger sequence are cut by steeply dipping, mainly north-striking normal faults (Thorsteinsson, 1984, p. 272).

In 1983, Thorsteinsson discovered a small, but rather spectacular sulphide deposit (Shore showing) near the southwestern extremity of Baillie Hamilton Island at 75º46'16"N, 94º44'08"W (Thorsteinsson, 1984). It consists mainly of pyrite and marcasite with small amounts of galena and occurs along the crest of an anticline that is exposed at the base of northwest-trending sea cliffs. The sulphides have infilled the pores and vugs in dolomite in the upper part of the Lower Devonian Disappointment Bay Formation.

This discovery is the fifteenth known lead-zinc showing in the Cornwallis Lead-Zinc District (Fig. 4-7) and is of interest for two reasons: 1) sulphide deposits in the Disappointment Bay Formation are rare (Kerr, 1977b), and the present deposit adds to the interest in this formation as a potential host for lead-zinc ore bodies in the Cornwallis district; and 2) there is a possibility, however tenuous, that at this locality the Disappointment Bay Formation lies directly on the Thumb Mountain Formation and the deposit represents the uppermost mineralized part of an ore body at depth in the latter formation (Thorsteinsson, 1984).

CURRENT WORK AND RESULTS

In July 1984, a four-person crew prospected the permit areas and mapped and sampled the Shore and Inland showings.

Shore Showing

This showing, reported by Thorsteinsson (1984), is described above. The sulphides are more than 90% pyrite and marcasite but contain up to 0.7% combined lead and zinc.

A second area consists of disseminated pyrite and marcasite 15 to 20 m above the Shore showing and 1 km north of the Galena showing.

Inland Showing

This showing comprises disseminated pyrite and marcasite in vuggy dolomites of the Disappointment Bay Formation, that lie a few metres above the unconformity with the underlying Cape Phillips Formation. The Inland Showing is 1500 m east

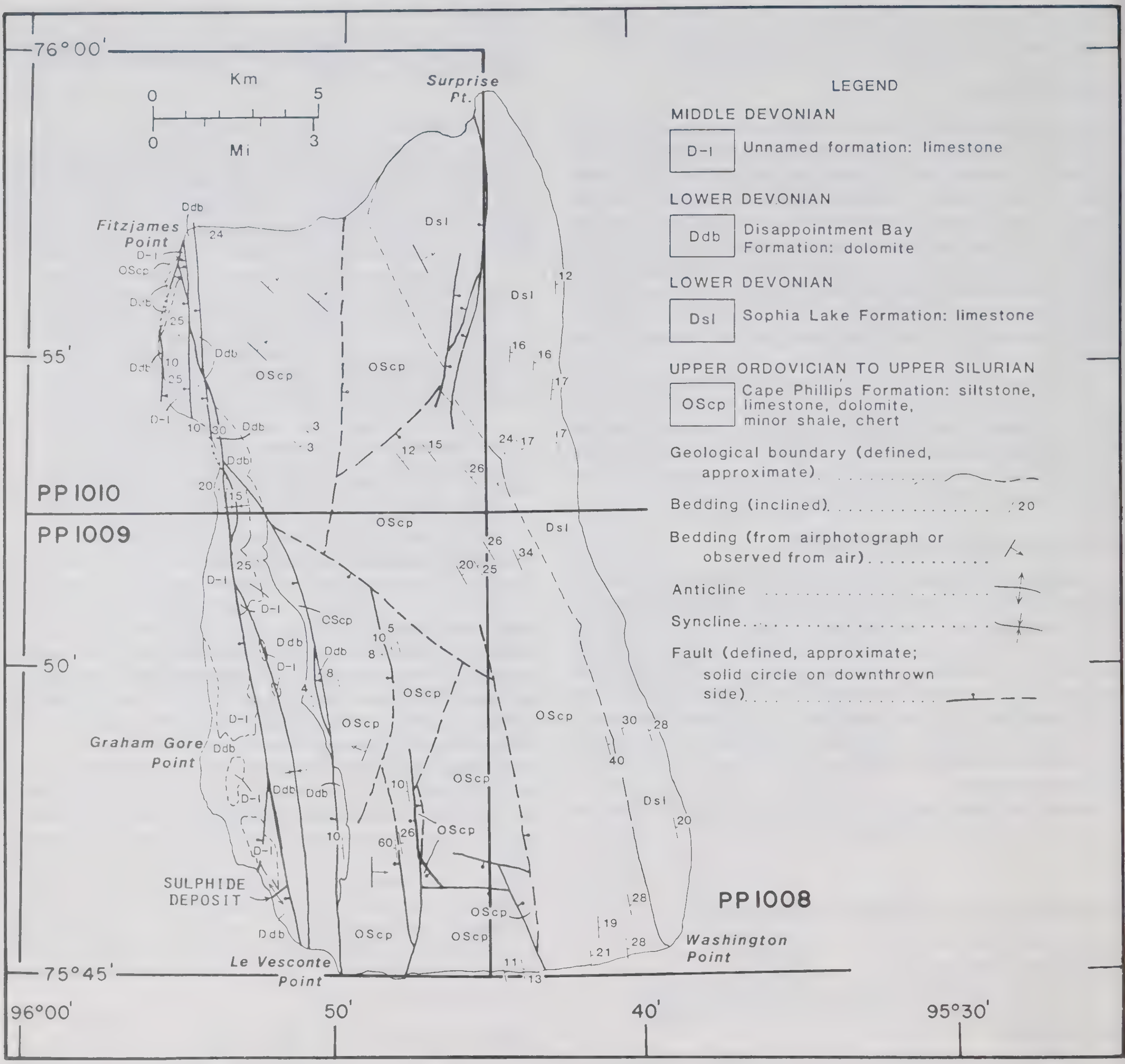

FIGURE 4-8: Geological map of Baillie Hamilton Island (from Thorsteinsson, 1984).

of the coast and appears to show similar stratigraphic and mineralogical features to those of the Shore showing. These showings are traceable for about 20 m along strike.

BORDEN BASIN-BORDEN PENINSULA, BAFFIN ISLAND

Borden Peninsula, part of northern Baffin Island, is 500 km north of the Arctic Circle. The area of interest, containing the Society Cliffs Formation, is bounded by the Strathcona Sound and Adams Sound grabens and extends from Admiralty Inlet on the west beyond Milne Inlet in the east-southeast (Fig. 4-9).

Most of Borden Peninsula is underlain by Neohelikian shales, quartz arenites, greywackes, arkoses, conglomerates and carbonates (Table 4-7). The carbonates commonly contain stromatolites or bioherms or both. About 90 to 150 m of tholeiitic plateau basalts occur near the base of the sequence. Faulting occurred during deposition that took place in a southeasterly trending rift zone.

A complex assemblage of Aphebian-Archean gneisses is separated from the overlying Neohelikian strata by a nonconformity. A thin regolith is present in a few places on the gneisses, which are commonly stained red for several metres below the nonconformity (Jackson and others, 1978, p. 3).

Mississippi Valley-type zinc-lead deposits occur in the

Society Cliffs Formation at Nanisivik, Hawker Creek and elsewhere on Borden Peninsula. The Society Cliffs Formation is characterized by thick to massive beds of regularly laminated, brownish-grey to grey stromatolitic dololutite and dolosiltite. Planar stromatolites are ubiquitous; low domal varieties are common and cabbage-head types are less common (Jackson and others, 1978). Society Cliffs strata are shallow, subtidal to intertidal in origin. A strong, fetid, petroliferous odour is normally given off by freshly broken rock. Dolomite breccia is common and some of this brecciation can be related to early karsting (Olson, 1984; Geldsetzer, 1974a, b).

Hadrynian diabase intrudes all older rocks in the area and remnants of flat-lying Paleozoic sandstones and dolomite extend onto Borden Peninsula from adjacent parts of Baffin Island.

Papers by Jackson and Iannelli (1981) and Jackson, Iannelli and Tilley (1980) give a recent geological synthesis of the region.

Mineral Exploration:

Mineral exploration in the Borden Basin has been mainly for Mississippi Valley-type lead-zinc deposits in the Society Cliffs Formation dolomite (Nanisivik Mines Ltd.) and for shale-hosted lead-zinc deposits in the Arctic Bay and Victor Bay Formations (Petro-Canada Ltd.). Work was more or less restricted to the Nanisivik mine property (see Chapter 2) and the southeasterly-trending belt of Uluksan Group and upper Eqalulik Group sediments that bisect Borden Peninsula and the Borden Basin; this area extends from Strathcona Sound (Admiralty Inlet) in the northwest to Milne Inlet in the southeast (Fig. 4-9). It corresponds to the central North Baffin Rift Zone of Jackson and Ianelli (1981).

In 1981, Nanisivik Mines Ltd. began regional exploration of the area underlain by Society Cliffs Formation by contracting Aerodat Ltd. to fly 5,352 line km of helicopter-borne magnetic, electromagnetic and VLF-EM survey and Paterson, Grant and Watson Ltd. to compile and interpret this data. Some 150 EM and VLF-EM conductors were identified as probably of bedrock origin and 74 of these were recommended for further investigation (Gibbins, 1984). Nanisivik Mines Ltd. obtained 14 Prospecting Permits in February 1982 to protect areas of interest.

In 1983, a Petro-Canada Ltd. subsidiary, 103912 Canada Inc., obtained 12 Prospecting Permits (957-968) that mainly include areas underlain by Arctic Bay Formation shales. In 1985, they obtained three more permits (1044-1046) near Elwin Inlet (Fig. 4-10). Nanisivik Mines Ltd. relinquished 13 of 14 prospecting permits at the beginning of 1984 and Petro-Canada Ltd. relinquished 9 permits (957-965) at the beginning of 1985.

In 1982-83, Nanisivik Mines Ltd, did geochemical and geophysical surveys, geological mapping and prospecting in areas deemed to have favourable mineral potential (Gibbins 1985, p. 123-132). Some of these areas were drilled in 1984. In 1985, Nanisivik Mines Ltd. concentrated on geophysical surveys west and south of the mine area and geophysical

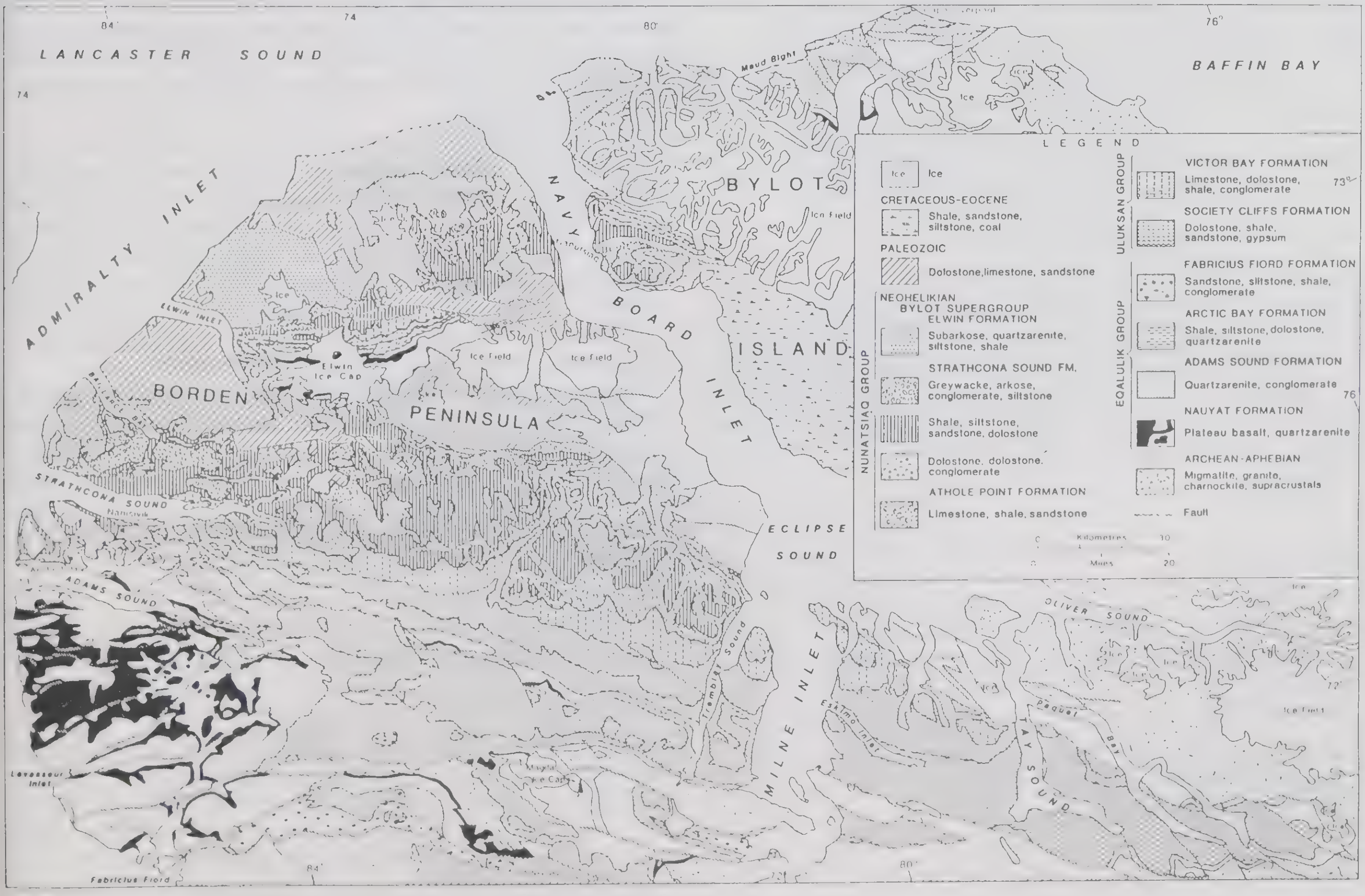

FIGURE 4-9: Geology of the Borden Basin (from Jackson and Iannelli, 1981).

TABLE 4-7: TABLE OF FORMATIONS, BORDEN BASIN (from Jackson and Iannelli, 1981).

HADRYNIAN			Franklin Intrusions: Diabase	
		GP	Intrusive Contact	
NEOHELIKIAN	BYLOT SUPERGROUP	NUNATSIAQ	Elwin Fm. (470-1220 m):	EL_1: Quartzarenite, siltstone EL_2: Sandstone, siltstone, dolostone
			Gradational	
			Strathcona Sound Fm: (430-910 m+)	SS_6: SS_{1-5} lithologies interbedded SS_5: Polymictic conglomerate SS_4: Siltstone, greywacke SS_3: Arkose-greywacke, shale SS_2: Dolostone, dolostone conglomerate SS_1: Shale, siltstone
			Gradational	
			Athole Point Fm: (0-585 m) Limestone, sandstone, shale	
			Gradational	Gradational to Unconformable
		ULUKSAN	Victor Bay Fm: (156-735 m)	VB_2: Limestone, dolostone, flat pebble conglomerate VB_1: Shale, siltstone, sandstone, limestone
			Conformable, Abrupt to Gradational	
			Society Cliffs Fm: (263-856 m)	SC_2: Stromatolitic & massive dolostones SC_1: Stromatolitic dolostone, shale, sandstone, gypsum
			Chiefly Unconformable?	Gradational to Unconformable
		EQALULIK	Fabricius Fiord Fm: (400-2000 m+) FF_4: Arkose, conglomerate, dolostone FF_3: Subarkose, conglomerate FF_2: Shale, quartzarenite FF_1: Quartzarenite, shale	Arctic Bay Fm: (180-770 m) AB_4: Shale, dolostone AB_3: Shale, siltstone AB_2: Shale, quartzarenite AB_1: Siltstone, quartzarenite
			Conformable, Abrupt to Gradational	
			Adams Sound Fm: (0-610 m) AS_3: Quartzarenite, conglomerate, shale AS_2: Quartzarenite AS_1: Quartzarenite, conglomerate	AS_U: Quartzarenite AS_L: Quartzarenite, conglomerate
			Conformable	
			Nauyat Fm: (0-430 m)	NA_2: Plateau basalt NA_1: Quartzarenite, subarkose, basalt
			Nonconformity	
ARCHEAN-APHEBIAN			Gr nitic gneiss basement complex: Migmatite, foliated granitic rocks, granite, charnockite, supracrustal relics	

surveys and drilling in the mine area. Nanisivik Mines Ltd.'s exploration budget for 1982-1985 was more than $5 million.

In 1984, Petro-Canada Ltd. completed geochemical and geological reconnaissance of their permit areas in the Arctic Bay Formation shales. In 1985, they concentrated on mapping and testing a silver-galena-barite showing near the head of Elwin Inlet.

BERT CLAIM

Nanisivik Mines Ltd.	Lead, Zinc
12th Floor, 20 Toronto St.	48 A/6
Toronto, Ont., M5C 2B8	72º28'N, 82º45'W

REFERENCES

Gibbins (1984, 1985); Jackson and Iannelli (1981); Laporte (1974a); Padgham and others (1976).

DIAND assessment report: 081710.

PROPERTY

BERT.

LOCATION

The claim is about 83 km southeast of Nanisivik (Fig. 4-10). A small airstrip at Magda Lake is 15 km to the southeast. However, it usually becomes muddy during spring runoff.

HISTORY

The BERT claim was recorded on October 1, 1981, to protect mineral rights to an area that corresponds to a strong EM anomaly discovered during the 1981 reconnaissance airborne geophysical survey (Gibbins, 1984). Galena and lesser amounts of sphalerite were observed in float and overburden found on the claim.

Geologists working for King Resources Ltd. explored the Magda Lake region between 1970 and 1973 (Laporte, 1974a; Padgham and others, 1978), but apparently did not find the showing or EM conductor.

Geological mapping and prospecting in 1982 revealed sulphide minerals in several distinct areas. The most common showings are dyke or contact controlled. Massive galena and sphalerite are found in gossanous 'sandy' dolostone float of the basal part of the Society Cliffs Formation; assays in excess of 65% lead and zinc combined were obtained. Minor fracture fillings of yellowish sphalerite, galena, and smithsonite in the interbedded sandy and massive unit assayed up to 3.5% lead and zinc combined. Near the main dyke on the north grid, minor pyrite with sphalerite in 'cooked' dolostone float assayed up to 36% Zn. Hematite, after pyrite, has been observed throughout the Society Cliffs Formation sequence in varying amounts. In one area magnetite veins, a few centimetres wide, cut a 'bleached' dolostone at the contact with the northernmost gabbro dyke.

A geochemical soil survey outlined four zones of anomalous lead and zinc. The first appears to represent downslope transport of mineralized 'sandy' float from the Arctic Bay/Society Cliffs contact. The second zone appears to be related to more massive strata with Pb-Zn fracture fillings higher in the Society Cliffs Formation sequence. The third zone may also represent migration of mineralized float from the Arctic Bay/Society Cliffs contact, whereas the fourth zone appears to be dyke related.

Magnetic and VLF-EM surveys of the total grid area outlined gabbro dykes. The VLF Fraser filter contours outlined narrow zones believed to represent the Arctic Bay Formation/Society Cliffs Formation contact near the center of the claim (Gibbins, 1985).

Additional geological mapping, geochemistry and IP work on detailed grids were completed in 1983.

DESCRIPTION

BERT is in the Borden Basin, an aulacogen-like structure that evolved within the North Borden Rift Zone (Jackson and Iannelli, 1981).

The majority of the claim area is underlain by fine-grained black fissile shales of the Arctic Bay Formation. These are locally overlain by dolostones of the Society Cliffs Formation. These formations are cut by two phases of fault-controlled dyke swarms; an older east-trending Borden dyke swarm and a younger northwest-trending Franklin dyke swarm (Jackson and Iannelli, 1981).

CURRENT WORK AND RESULTS

In 1984, ten holes (452 m) were drilled on the claim. Four holes tested a dyke-related EM anomaly on the north grid, five holes tested a series of broad, medium-strength IP anomalies on the north and south grids, and the tenth hole was drilled in an area of galena bearing float on the south grid.

No galena was found in the drilling, only minor pyrite related to the diabase dykes. The dykes are believed to be the main cause of a copper anomaly and the strong EM response. This response is explained by metamorphosed shale near the dykes. The IP response was in response to limonite zones in sandy dolomite. Galena and sphalerite are rarely present and related to the Society Cliffs Formation - Arctic Bay Formation contact.

PROSPECTING PERMITS 957-968

Petro-Canada Ltd.	Lead, Zinc
P.O. Box 2844	48 A/5,11-13,B/16
Calgary, Alta., T2P 3E3	72°15-45'N,
	82°30'-84°30'W

REFERENCES

Blackadar and others (1968a-d); Gibbins (1984, 1985); Jackson and Iannelli (1981); Laporte (1974a,b); Olson (1984); Sangster (1981).

DIAND assessment report: 081834.

PROPERTY

Prospecting Permits 957-968.

LOCATION

The permits are on Borden Peninsula, northern Baffin Island, between Arctic Bay and Milne Inlet (Fig. 4-10). They are

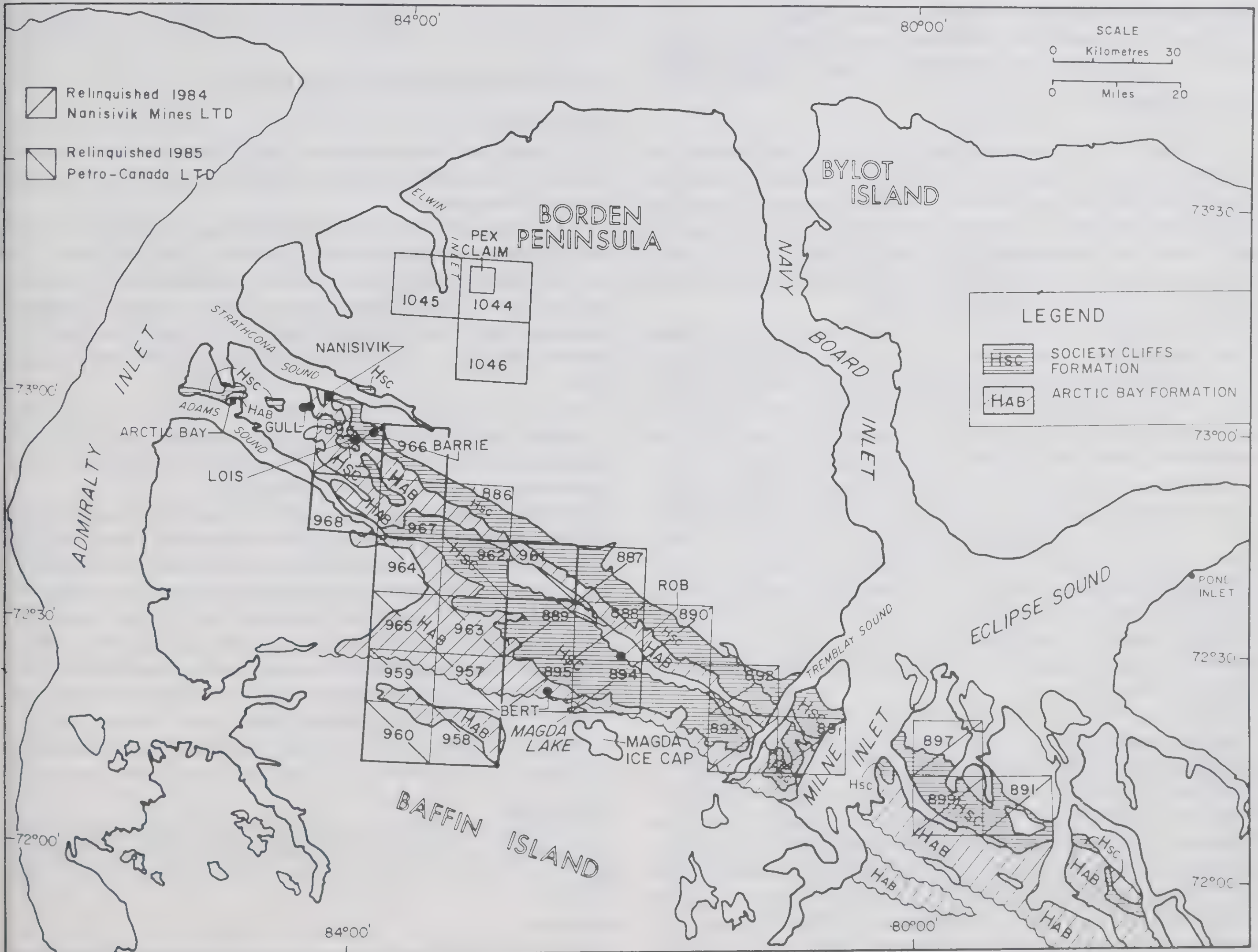

FIGURE 4-10: Claims and permit areas Borden Peninsula, northern Baffin Island. See Figure 4-11 for claims south of Strathcona Sound.

generally southeast of the head of Adams Sound between longitude 83° and 84° west.

HISTORY

The Geological Survey of Canada mapped the area on a reconnaissance scale (1:253,440) in the sixties (Blackadar and others, 1968a-d). Mineral rights to NTS areas 48 A/11-13 and B/16 were previously held by King Resources Ltd. as Prospecting Permits 86-89 between 1969 and 1972 (Laporte, 1974a,b and Olson, 1984).

In 1981, Petro-Canada Ltd. prospected and did lithogeochemical prospecting and stream-sediment-sampling surveys in the area. The principle target was clastic and carbonate sediments of the Proterozoic Bylot Supergroup, with emphasis on assessing the metal and uranium content of black shales. No significant mineral occurrences were discovered, however, several sites of high lead and zinc content (6,000 ppm combined) were found in shales of the Arctic Bay Formation (Gibbins, 1984, p.84).

In August 1983, follow-up work, mainly prospecting and collection of heavy mineral samples, was done in areas of Arctic Bay Formation shales that contained significant rock geochemical anomalies in 1981 (Gibbins, 1985).

Prospecting Permits 957-968 were obtained in February 1983. Nine of these (957 to 965) were relinquished in February 1985.

DESCRIPTION

Like most of the southern Borden Basin, the permits are underlain by dark argillaceous carbonate and shale units of the Arctic Bay Formation (Table 4-7). Locally, pyritic shale is the predominant lithology: siltstone and quartz arenite interbedded with shale form the lower part of the formation; and siltstone, dolostone and quartz arenite interbedded with shale form the upper part (Jackson and Iannelli, 1981).

The formation ranges from 500 to 770 m thick throughout most of the area. The lower contact with the Adams Sound Formation is conformable and gradational. Some shale beds contain concretions and cone-in-cone structures. White gypsum efflorescence and calcareous coatings are common on the shales and some strata emit a strong petroliferous odour.

Jackson and Iannelli (1981) distinguished four intergradational members of the Arctic Bay Formation in the area (Table 4-7). However, the entire formation is distinctly different southeast of Milne Inlet. Planar-laminated micaceous black-grey shale predominates in the AB_3 member, which is up to 400 m thick on Borden Peninsula. Jackson and Iannelli (1981, p. 279) interpreted the monotonous black shales of the AB_3 member as having accumulated in shallow to deep subtidal to basinal environments.

Sangster (1981) recommended the shales of the Borden Basin and particularly the Arctic Bay Formation shale as a prospective area for shale-hosted stratiform lead-zinc deposits on the basis of geology and by comparison with well-known deposits of this type. He pointed out several impressive, favourable indicators are present in the Borden Basin, namely syn-sedimentary faulting of the Arctic Bay Formation in the North Borden Rift Zone and the possibility of second-order basins the size of individual lead-zinc deposits. He also suggested that at least part of the Borden Basin may be a lead-zinc metallogenic province, as demonstrated by the lead- zinc deposits at Nanisivik.

TABLE 4-8: LITHOGEOCHEMISTRY - BORDEN BASIN (values in ppm unless otherwise indicated)

	MEAN	STANDARD DEVIATION	POSSIBLY ANOMALOUS ($x+3S$)	DEFINITELY ANOMALOUS ($x+2S$)
SHALE (47)				
Copper	210	645	1500	2145
Lead	51	87	225	312
Zinc	188	383	954	1337
Silver	1.4	0.65	2.7	3.35
Barite	603	1536	3675	5211
Iron %	7.85	8.27	24.36	32.66
CARBONATE (24)				
Copper	68	157	382	539
Lead	124	349	822	1171
Zinc	358	658	1674	2332
Silver	1.33	0.81	2.95	3.76
Barite	266	205	676	881
Iron %	5.44	8.38	22.2	30.58
SANDSTONE (53)				
Copper	243	777	1847	2624
Lead	21	86	193	279
Zinc	71	298	667	965
Silver	0.73	1.00	2.73	3.73
Barite	345	522	1389	1911
Iron %	2.37	5.76	13.89	19.65

CURRENT WORK AND RESULTS

Geochemistry

1) Stream sediment samples: The 1981 survey showed that secondary dispersion of target elements is not effective on the Borden Peninsula.

2) Lithogeochemical samples: Lithogeochemical samples were collected during ground traverses in 1983 and 1984. The samples were crushed to -200 mesh and analyzed for copper, lead, zinc, iron, manganese, barium, gold and silver. Statistical parameters were calculated for each lithology (Table 4-8) and several anomalies were identified and examined (Tables 4-9 and 4-10).

Early in the 1983 field season, it was determined that anomalies in shale and siltstone areas were best explained by manganese adsorption of zinc and lead. Consequently, emphasis was shifted to other lithologies.

3) Heavy mineral samples: In 1983, 52 heavy mineral samples were collected from the active part of important stream courses draining the Arctic Bay Formation. The samples were sieved, dried, and separated with heavy liquids and an electromagnetic separator by C.F. Mineral Research Ltd. of Kelowna, B.C. Heavy paramagnetic (HP), heavy non-magnetic (HN) and intermediate paramagnetic (IP) fractions were analyzed for copper, lead, zinc and/or silver. The results were statistically treated (Table 4-11) and field checked.

Heavy non-magnetic mineral concentrates were microscopically examined for kimberlite indicator minerals.

Geophysics

1) VLF-EM survey: A small grid was laid out over a zinc-rich zone in Prospecting Permit 967 in 1984. No conductor was detected.

Results

During the 1983 field season, a rock sample (#602) was collected in the south central part of Prospecting Permit 967 (48 A/13 SW) that assayed 17% Zn. This area, 8 km east-northeast

TABLE 4-9: LITHOCHEMICAL ANOMALIES, MILNE INLET, NTS 48 A

NO.	LOCATION	ELEMENT(S)	FORMATION	HOST ROCK	COMMENTS
011	ER483500/8088200	Cu 2900	AS	Quartz arenite	- traces of disseminated malachite: not significant
406	ER589300/8088600	Cu 4300	AS	Quartz arenite	- traces of disseminated microscopic chalcocite and malachite: not significant
822	ER591200/8078200	Ba 870	NA_2	Stromatolitic limestone marker between basalt flows	- traces of chalcopyrite, 20 cm thick: insignificant
823	ER591200/8078200	Cu 2030	NA_2	Stromatolitic limestone marker between basalt flows	- traces of chalcopyrite, 20 cm thick: insignificant

** see figure 4-7 for formation names*

TABLE 4-10: LITHOCHEMICAL ANOMALIES, MOFFAT INLET, NTS 48 B

SAMPLE NUMBER	LOCATION	ELEMENT(S)	FORMATION	HOST ROCK	COMMENTS
50	ML412800/8073300	Pb 330 Zn 1040	AB_4	Dolomite	- minor disseminated galena: not significant
508	ML403300/8100800	Pb 1680 ZN 53000 Ag 4.1	SC	Brecciated Dolomite	- known occurrence of galena - sphalerite
602	ML411200/8077300	Zn 173000	SC	Carbonate Breccia	- contains "iron oxides", no smithsonite recognized: may be significant
605	ML402400/8077300	Cu 780	SC	Rusty Dolomite	- Rusty Talus
802	ML410300/8073500	Ba 18200	AB_4	Dolomite laminae in shale	- traces of galena observed: not significant
805	ML410300/8073500	Pb 450	AB_4	Dolomite laminae in black shale	- traces of galena observed: not significant
806	ML410300/8073500	Zn 2400 Ba 6200	AB_3	Pyritic dolomitic shale laminae	- only minor pyrite observed: not significant
810	ML403900/8075800	Ag 3.2	AB_4	Laminated pyrite L3 shale	- 2.3 cm thick: not significant
3803	ML411200/8077300	Zn 100800	SC	Breciated Dolomite	- mineralized zone 2 to 5 m wide extending for about 200 m along strike
3804	ML411200/8077300	Zn 135000	SC	Breciated Dolomite	

** see Figure 4-7 for formation names.*

of the head of Adams Sound, was re-visited and prospected in 1984. Orange-brown, iron-stained breccia was easily distinguished from barren grey dolomite. The showing consists of a rusty weathered zone in felsenmeer of Society Cliffs Formation and varies from 2 to 5 m in width and extends for about 200 m along strike. Although the zinc grade is of economic interest, zinc minerals could not be identified in hand specimen and the showing is considered to be too discontinuous to have economic importance.

Several new showings of copper were found near the head of Adams Sound in the Adams Sound, Nauyat and Strathcona Sound Formations (Table 4-7). Sparse chalcocite, chalcopyrite, pyrite and magnetite occur as discrete grains in Adams Sound Formation arenite. Disseminated chalcopyrite also occurs sparingly in the Nauyat Formation on the south side of Adams Sound, 10 km north of Mt. Podolsky. The chalcopyrite is restricted to a 1.5 m thick stromatolitic limestone layer found between two basalt flows near the top of the formation.

The heavy mineral sampling program outlined several anomalous sites (Table 4-12). Samples with multi-element and

TABLE 4-11: HEAVY MINERAL GEOCHEMISTRY BORDEN BASIN

ELEMENT	FRACTION	POPULATION	MEAN (ppm)	STANDARD DEVIATION (ppm)	THRESHOLD ($x+2S$) (ppm)	DEFINITELY ANOMALOUS (ppm)
Copper	-20 HN[1]	52	715	2035	2750	4800
	-20 HP[2]	52	105	85	190	275
Lead	-20 HN	52	35	55	90	150
	-20 HP	52	80	80	160	250
Zinc	-20 HN	52	1900	5600	7500	13000
	-20 HP	52	265	385	650	1000
	-20 IP[3]	52	285	95	380	480
Silver	-20 HN	52	0.1	0.1	0.2	0.3
	-20 HP	52	0.2	0.15	0.4	0.5

[1]: *-20 HN = -20 mesh heavy non-magnetic fraction*
[2]: *-20 HP = -20 mesh heavy paramagnetic fraction*
[3]: *-20 IP = -20 mesh intermediate gravity paramagnetic fraction*

TABLE 4-12: HEAVY MINERAL ANOMALIES, BORDEN BASIN

			Location
A-Rated Anomalies			
348*	-20 HP	Pb 469, Zn 2850+	NTS 48 A
	-20 IP	Zn 602	ML424500/8079800
380	-20 HN	Cu 5200, Zn 15500	NTS 48 B
	-20 HN	Cu 351	ER593900/8086500
B-Rated Anomalies			
342	-20 HP	Cu 365, Ag 0.7 (Pb 213**)	NTS 48 A ML405100/8083200
378	-20 HN	Cu 13600, Zn 36000	NTS 48 A ML403200/8092800
C-Rated Anomalies			
345	-20 HN	Ag 0.3, (Pb 99)	NTS 48 A ML415800/8082700
351	-20 HP	Cu 353, (Ag 0.4)	NTS 48 A ML405000/8074500
D-Rated Anomalies			
281	-20 HN	Pb 340	NTS 48 A ML425000/8023000
	-20 HP	Pb 250	

* *Sample number.*
\+ *Listed here is the fraction, element, and concentration (in ppm).*
** *Possibly anomalous value are in brackets.*

multi-size fraction anomalies are likely to be the most important. Residual heavy minerals included a number of ilmenite grains, but other kimberlite indicator minerals like pyrope and chrome diopside were rare or of dubious identity.

PROSPECTING PERMIT 886

Nanisivik Mines Ltd. — Zinc, Lead
12th Floor, 20 Toronto St. — 48 A/13 SE
Toronto, Ont., M5C 2B8 — 72°52′N, 83°15′W

REFERENCES

Gibbins (1983a, 1984, 1985); Jackson and others (1978, 1980); Jackson and Iannelli (1981); Laporte (1974a); Olson (1984).

DIAND assessment report: 081722 (1983 work).

PROPERTY

Prospecting Permit 886.

LOCATION

Prospecting Permit 886 is centered 48 km east-southeast of the Nanisivik mine. The Adams River flows northwesterly through the permit area from its southeast corner. There is a small airstrip near the center of the permit area on the northeast side of the Adams River (Fig. 4-10).

The Hawker Creek pyrite-sphalerite-galena showings (Gibbins, 1983a, p.28-30) are centered near the northwest corner of Permit 886.

HISTORY

The area has been explored for Nanisivik-type ore deposits since 1963 (Laporte, 1974a). Most of this work was done for King Resources Ltd. and its successor, Global Arctic Islands Ltd. by Trigg Woollett Consulting Ltd. Olson (1984) discussed the results of exploration in the Hawker Creek, Adams River and Surprise Creek areas, which fall in or adjacent to the permit area.

Prospecting Permit 886 is one of the fourteen permits obtained by Nanisivik Mines Ltd. in February, 1982, to protect outcrop areas of Society Cliffs Formation and anomalies outlined by the 1981 Aerodat Ltd. reconnaissance airborne geophysical survey (Gibbins, 1984, p.86).

A number of airborne geophysical anomalies were ground checked in 1982. Grids were established over areas of interest and were subsequently prospected, geologically mapped, geophysically tested (VLF-EM and magnetic) and geochemically sampled (copper, lead and zinc analyses of soil samples).

In July 1983, an IP chargeability/resistivity survey was conducted over the central part of the permit. A couple of areas with coincident IP, EM and zinc anomalies were recommended for drilling.

A grid set up over an airborne-detected geophysical anomaly (2-B2-11), near the center of the southeast quarter of Permit 886, was mapped and sampled. Massive, brecciated dolomites of the Society Cliffs Formation have been intruded by a northwesterly trending gabbro dyke just south of the baseline. A steel-blue altered zone, produced by the intrusion, is present along the dyke margin in much of the area. Four gossan zones were discovered, including one in the altered zone. Geochemical results included spot highs, but were generally low for copper, lead and zinc, even in the gossan zones. No economic base-metal sulphides were found within the gossans, however, two showings of galena and sphalerite were found in association with secondary dolomite as fracture fillings (Gibbins, 1985).

DESCRIPTION

The permit is in the central part of the Central Borden Rift Zone of the Borden Basin (Jackson and others, 1978, 1980; Jackson and Iannelli, 1981). This rift zone contains most of the outcrop of Society Cliffs Formation dolomite, which is the host rock of the ore at the Nanisivik Mine.

Several airborne-detected geophysical anomalies (EM conductors) are near the center of Prospecting Permit 886 (2-B2-2,4,5,5A and 7) and one is near the center of the southeast quarter (2-B2-II).

The northeast half and southeast corner of Prospecting Permit 886 is underlain by northwesterly trending belts of Society Cliffs Formation dolomite (Figures 4-9 and 4-10). These belts form topographic highs that are separated by the valley of the Adams River, which is underlain by Arctic Bay Formation shales and extends from the southeast corner to the mid-point of the western boundary of Prospecting Permit 886.

CURRENT WORK AND RESULTS

In 1984, the central grid was extended southward and more IP, VLF-EM and magnetic surveys were completed.

Five drill holes (203 m) tested dyke related IP anomalies in Arctic Bay Formation shale. Only minor amounts of pyrite and graphite were found.

LOIS CLAIM

Nanisivik Mines Ltd.	Gold, Copper
12th Floor, 20 Toronto St.	48 B/16
Toronto, Ont., M5C 2B8	72°55′N, 84°08′W

REFERENCES
Blackadar and others (1968d); Gibbins (1984, 1985); Jackson and Iannelli (1981).

DIAND assessment report 081695 (1983 work).

PROPERTY
LOIS.

LOCATION
The claim is 20 km southeast of Nanisivik (Fig. 4-10).

HISTORY
An airborne geophysical survey, done for Nanisivik Mines Ltd., identified a strong conductive anomaly adjacent to a gabbro dyke. Dyke related anomalies are common in the region and it was decided to study one of these anomalies in detail. Consequently, LOIS was recorded in October 1981.

In 1982, the area was covered with reconnaissance geological, geochemical and geophysical surveys. The latter included maxmin EM, VLF-EM, magnetometer and IP work. Quartz-carbonate chalcopyrite veinlets in float assayed up to 7.0 g/t (0.20 oz/ton) Au and 5.7% Cu in float (Gibbins, 1985, p. 130).

DESCRIPTION
The area is in a portion of the Borden Basin that evolved within the North Baffin Rift Zone (Jackson and Iannelli, 1981). Strata in the area of the claim, mainly fine-grained black fissile shales of the Arctic Bay Formation, are overlain by algal laminated and massive dolostones of the Society Cliffs Formation (Blackadar and others, 1968d). All these formations are cut by two phases of fault-controlled dykes, an older east-trending Borden dyke swarm and a younger northwest-trending Franklin dyke swarm.

CURRENT WORK AND RESULTS
In 1984, two holes (198 m) tested two very strong EM anomalies on the north flank of an east-trending gabbro dyke. Both holes intersected altered shales near the dyke contact. The first hole contained a 0.5 m of chalcopyrite-pyrite-bearing zone that assayed 0.44% Cu and 0.27% Zn, but no gold.

BN CLAIM

Nanisivik Mines Ltd.	Lead, Zinc
12th Floor, 20 Toronto St.	48 B/16,C/1
Toronto, Ont., M5C 2B8	73°N, 84°02′30′W

REFERENCES
Blackadar and others (1968c and 1968d).

PROPERTY
BN.

LOCATION
The claim is centered on the northeast side of Barrie Creek, 15 km east-southeast of the Nanisivik townsite or 10 km east-southeast of the south end of Kuhulu Lake.

HISTORY
In 1983, a small area, just outside an area covered by a 1981 Aerodat airborne geophysical program, was geologically mapped and geochemically surveyed. BN was recorded in September 1985.

DESCRIPTION
The area is underlain by dolostones of the Society Cliffs Formation and shales of the Victor Bay Formation (Blackadar and others, 1968c and 1968d).

CURRENT WORK AND RESULTS
In 1985, a grid was established and VLF-EM, GEM-8 and soil geochemical surveys were completed. The GEM-8 survey identified one deep anomaly. However, this was not confirmed by VLF work. Geochemical results were not available when this summary was written (March, 1986).

NANISIVIK WEST PROJECT

Nanisivik Mines Ltd.	Zinc, Lead
12th Floor, 20 Toronto St.	48 C/1
Toronto, Ont., M5C 2B8	73°00-05′N, 84-85°W

REFERENCES
Blackadar and others (1968c); Geldsetzer (1973a, 1973b); Gibbins (1984, 1985); Gibbins and others (1977); Jackson and others (1978); Lemon and Blackadar (1963).

DIAND assessment reports: 081537; 081692.

PROPERTY
GULL, DEB, EMU, KANGA, ROO Original block
TGS, MRI, SMS, West block
KO, ALA North block

LOCATION
The claims adjoin the Nanisivik mine property. They extend westerly from a point 2 km southwest of the Nanisivik townsite to 15 km southwest of the town, about half way to the community of Arctic Bay (Fig. 4-11). The area is bordered on the north by Strathcona Sound and on the south by the Arctic Bay road.

HISTORY
The GULL claims were staked in 1972 to protect possible westward extensions of the Nanisivik deposit. Geological and VLF-EM surveys were done on the claims in 1974 (Gibbins and others, 1977). In 1976, a McPhar SS-15 system (vertical loop EM) detected several weak, unexplained anomalies.

In 1981, a geophysical survey of the area comprising magnetic, coplanar and coaxial EM and two channels of VLF-EM, was flown at 400 m line spacings with the EM boom at a height of 30 m (Gibbins, 1984). DEB was staked in 1982 to cover an airborne-detected anomaly (6-A2-4) outlined by the geophysical survey, south of the GULL claims.

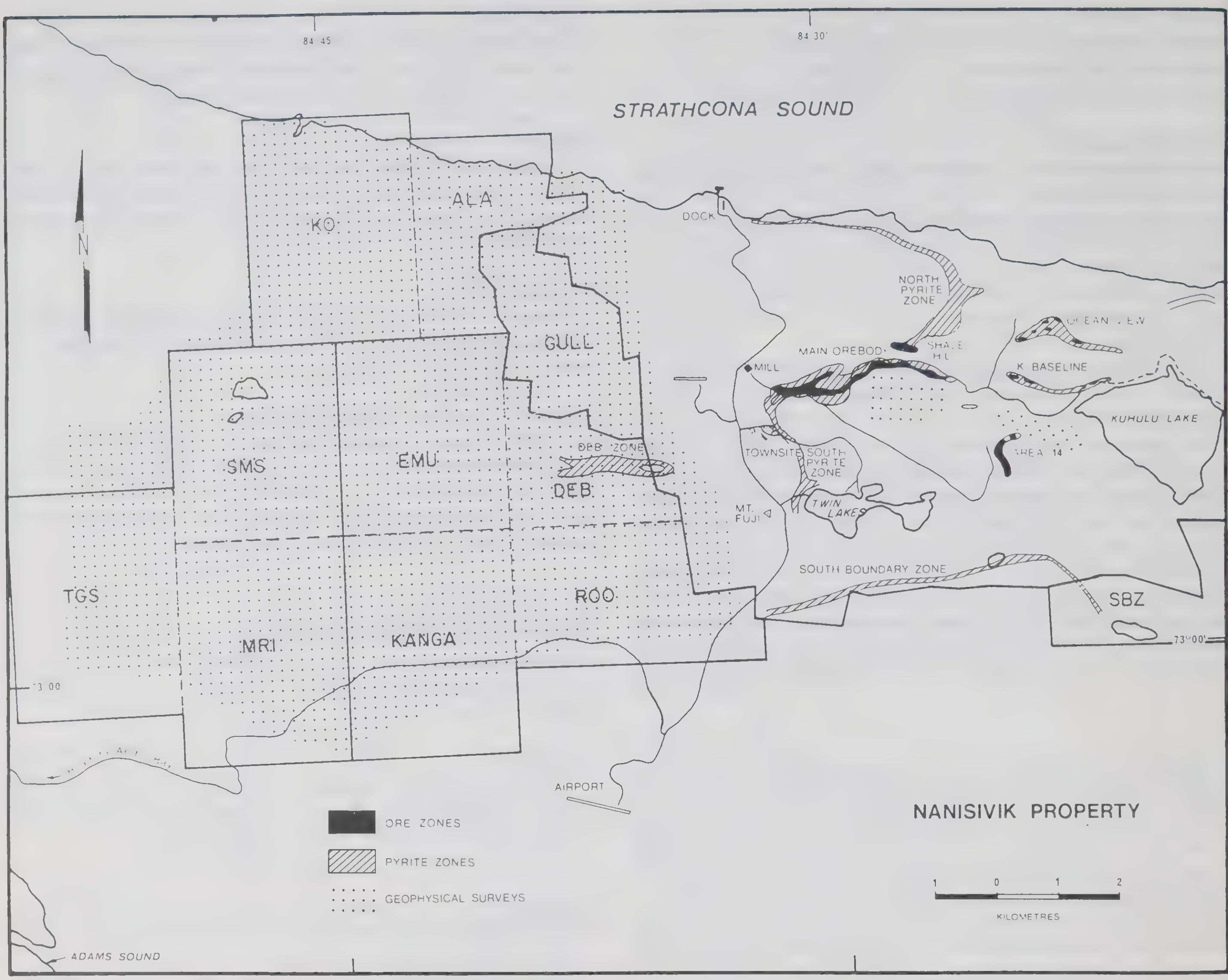

FIGURE 4-11: Sulphide zones and mineral claims Nanisivik, NWT (modified from Nanisivik Mines Ltd. Annual Report 1985).

In 1982, VLF-EM, Max-Min EM, IP and magnetometer surveys on DEB and the southeast corner of the GULL claims were designed to check for possible extensions of a good conductor on the RAVEN claims just east of the GULL claims. The results were consistent with shallow conductive overburden. The magnetometer survey did not indicate any magnetic bodies (i.e. gabbro dykes).

Exploration on the nearby RAVEN claims led to discovery of dolostone of the Society Cliffs Formation in the southeast corner of the GULL claim group. This indicated that the southern part of the group probably has only a thin cover of shale and glacial drift and may be considered for exploration for massive sulphides within the Society Cliffs Formation.

Because of the favourable location and geology, Turam and IP surveys of DEB and the adjacent RAVEN claims were extended into the GULL claims in 1983, despite the fact that previous geophysical surveys (VLF and vertical loop EM) did not yield indications of conductive sulphide minerals (Gibbins, 1985). The Turam EM Survey outlined two strong conductors extending up to 1500 m in an easterly direction at an interpreted depth of 100 m.

The geology of the GULL-DEB-RAVEN area was mapped in September 1983 by R. von Guttenburg of Metallgesellschaft Canada Ltd.

The remaining claims were staked during the summer of 1984. The GULL claims were permitted to lapse in November 1985 and were restaked in January 1986.

DESCRIPTION

The region is underlain by a sequence of Helikian sediments that are generally flat lying but commonly block faulted. The most recent regional geological maps are those of Blackadar and others (1968c) and Lemon and Blackadar (1963). However, the Geological Survey of Canada has done additional mapping in the area since 1977 (Jackson and others, 1978).

The GULL claims are underlain by dolomitic shales of the lower Victor Bay Formation and dolomite of the middle Victor Bay Formation. Society Cliffs Formation dolomite, which

normally underlies the Victor Bay Formation and hosts the lead-zinc deposit at Nanisivik (Gibbins and others, 1977), outcrops only in the southwest corner of the claims. Earlier geological mapping and drilling to the east of the claims suggested it is present at a depth greater than 120 m. Almost 450 m of Society Cliffs Formation has been measured in the region, thus it was expected to occur on the claims at depths between 120 and 670 m. However, it is now known to be closer to surface, even though extensive pre-Victor Bay karsting in the area (Geldsetzer, 1973a, 1973b) may have removed some of the Society Cliffs Formation.

Northwest-trending diabase-gabbro dykes intrude the Victor Bay and Strathcona Sound Formations in adjacent areas.

CURRENT WORK AND RESULTS

The McPhar GEM 8 system was chosen for reconnaissance geophysical surveys because it provides the deep penetration needed to identify massive sulphides like the DEB Zone. Interesting areas are then tested up with closer spaced VLF-EM, magnetometer and GEM 8 broadside surveys. In 1984, geophysical work consisted of reconnaissance and follow-up of the original block (DEB, EMU, KANGA and ROO claims), and reconnaissance of the western block (TGS, SMS and MRI claims).

Early in 1984 (May and April), 18 holes (2882 m) outlined two east-trending lenses of massive pyrite at the Victor Bay Formation - Society Cliffs Formation contact. These lenses are known as the DEB Zone (Figure 4-11). Two of these holes tested a 1983 IP anomaly just east of the DEB Zone but no sulphides were found at the contact.

Late in 1984, 15 holes (2650 m) were drilled in 6 areas to test 10 anomalies. Karst-related oxidation, limonite staining, dissolution and resedimentation were encountered in every area. Hematite mud in enlarged fractures and karst tubes probably accounts for most of the geophysical anomalies. Area 1 is south of Mount Fuji (LION 14 claim, Mineral lease 2810). Here, the conductor is coincident with a fault that is down dropped at least 100 m on the west side. Specks and blebs of sphalerite were found in one hole. Anomalous areas 2 (ROO claim) and 3 (DEB claim) appear to be due to pyrite veinlets in Society Cliffs Formation dolostones. In Area 5 (EMU claim), the anomaly is caused by pervasive oxidation of collapsed dolostone shown by red hematite alteration and staining on fractures and clay zones. Areas 4 and 6 (MRI claim) appear to represent a westward extension of the South Boundary Zone, but unfortunately, the drills did not get through the overburden.

In 1985, the sequence was: follow-up on the western block, follow-up on the DEB claims, reconnaissance of the north block (KO and ALA claims) and follow-up of the north block.

Only one hole was drilled on these claims in 1985 as most of the 1985 drilling was done on targets in the immediate vicinity of the mine (Chapter 2). The single hole tested a geophysical anomaly on the GULL claims.

SBZ CLAIM-SOUTH BOUNDARY ZONE-EAST

Nanisivik Mines Ltd.	Lead, Zinc
12th Floor, 20 Toronto St.	48 C/1
Toronto, Ont., M5C 2B8	73°01°N, 84°20′W

REFERENCES

Clayton and Thorpe (1982).

PROPERTY

SBZ.

LOCATION

The claim is centered on a small lake, 2.5 km south of the south end of Kuhulu Lake and 6 km east-southeast of the Nanisivik townsite (Figure 4-11).

HISTORY

In 1981, the Aerodat survey identified two geophysical anomalies in the area (3-A2-30A and 3-A2- 31). In 1982-83, turam, VLF-EM, soil geochemistry and geological mapping were done in the claim area.

DESCRIPTION

The area includes the eastern extension of the South Boundary Zone where it bends to an east-southeasterly trend (Fig. 4-11). A topographic ridge and a gabbro dyke extend into the area from the area 14 deposit.

Two northwesterly trending faults form the north and south shore of the small lake near the centre of the claim. The South Boundary Zone is a massive to disseminated pyrite zone related to a major east-west fault south of Nanisivik (Clayton and Thorpe, 1982).

CURRENT WORK AND RESULTS

In 1984, two holes were drilled on the claim and SBZ was staked.

PROSPECTING PERMITS 1044-1046 AND PEX CLAIMS

Petro-Canada Ltd.	Silver, Barite
P.O. Box 2844	48 D/5,4
Calgary, Alta., T2P 3E3	73°25N, 83°25′W

REFERENCES

Blackadar and others (1968b); Jackson and Ianelli (1981). DIAND assessment report: 082057.

PROPERTY

Prospecting Permits 1044-1046; PEX 1-7.

LOCATION

The area is 40 to 85km northeast of Nanisivik.The permits and claims include the area south and east of the head of Elwin Inlet (Fig. 4-10). Permit 1044 includes the west half of the Elwin Ice Cap.

HISTORY

In 1983, Petro-Canada Ltd. geologists prospected northern Borden Peninsula in an effort to relate ore-genesis models to local geology. They decided that red bed copper in the basal

Strathcona Sound Formation and epigenetic silver in structural traps in the upper Adams Sound Formation offered the best targets. Several Ag-Pb-$BaSO_4$ anomalies were discovered as a result of the 1983 lithogeochemistry reconnaissance. In July 1984 the PEX claims were staked and in February 1984 Prospecting Permits 1044 to 1046 were granted to protect the showings.

DESCRIPTION

The area of interest is underlain mainly by a variety of Neohelikian sedimentary units of the Bylot Supergroup. Granitic basement of Aphebian age, mafic volcanics of the Nauyat Formation (Basal Bylot Supergroup) and late Helikian gabbro-diabase dykes comprise the remaining bedrock (Table 4-7, Fig. 4-12, Blackadar and others, 1986b and Jackson and Iannelli, 1981). Drift, glacial ice caps and small lakes are common in the area.

Structure of the Borden Basin is related to a complex system of faulting. This system includes several periods and directions of rift-related faulting including major structures such as the Central Borden Fault Zone. In the Elwin Inlet area, west-northwest and east-northeast faults predominate (Fig. 4-12). One north-trending fault parallels much of the boundary between Prospecting Permits 1045 on the east and 1044 to the east. Several late diabase dykes trend north-northeast. The sediments are mainly horizontal or form shallow dipping fold limbs.

Silver, lead and barium minerals have hydrothermally replaced quartz arenites of the Adams Sound Formation in favourable zones along major faults. Samples assayed up to 330 ppm Ag, 0.06 to 7.6% Pb, 9 ppm to 14.5% Zn, up to 0.1% Cu and 0.11 to 22.0% Ba. However, these fault zones are only 10 to 25 cm wide. Silver is associated with both galena and pyrite mineralization. However, intense silicification of the Adams Sound Formation quartz arenites is believed to have restricted the extent to which hydrothermal replacement can occur.

CURRENT WORK AND RESULTS

In 1984, two to three geologists and assistants established 70 km of grid in the area of main interest (southwest PEX claims). Evaluation work included 1:5,000 scale geological mapping, magnetic and VLF-EM surveys, and a soil geochemistry

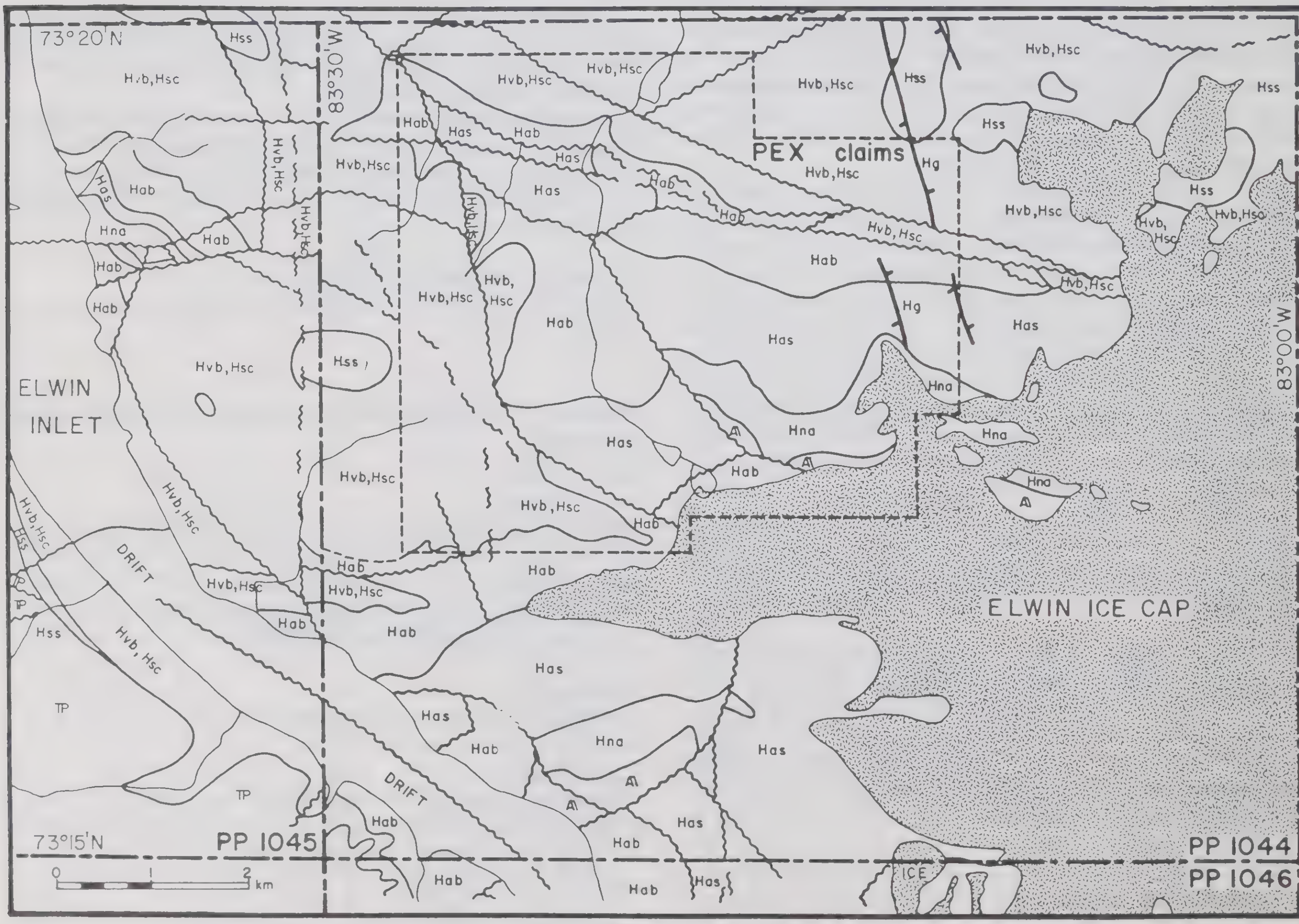

FIGURE 4-12: Geology of the PEX claims (modified from Blackadar and others, 1968b; and Jackson and Iannelli, 1981).

survey of the gridded area. Trenching and channel sampling across fault zones were also attempted.

The 1984 grid was reconditioned and geological mapping and geochemical sampling of the grid were completed and extended. A Turam-loop EM survey was done by Patterson, Grant and Watson Ltd. The depth to the conductor was calculated and used to guide diamond drilling. Eight holes (271 m) were drilled in the four main EM conductors. They are mainly narrow (10 to 25 cm) silver-bearing pyrite zones in a fault gouge.

Reconnaissance mapping and prospecting were completed south and west of the PEX claims and in the vicinity of Elwin Inlet. This work was directed to areas of Arctic Bay Formation shale in fault contact with Adams Sound Formation quartz arenites. A number of new mineral showings and gossans were noted and tested. However, none were considered to be of economic interest.

LEGEND

	QUATERNARY	
	Q	*Drift and unconsolidated sediments*
	CAMBRIAN TO MIDDLE SILURIAN	
	TP	*Admiralty Group, Ship Point and Baillarge Formations undivided*
	HELIKIAN	
	Hg	*Gabbro dykes*
PROTEROZOIC		ULUKSAN GROUP (Hab *to* Hel)
	Hss	*STRATHCONA SOUND FORMATION siltstone, sandstone, reddish mudstone and siltstone; minor dolomite and intraformational conglomerate*
	Hvb	*VICTOR BAY FORMATION: dark to pale grey dolomite; minor dark grey limestone and black mudstone and edgewise conglomerate*
	Hsc	*SOCIETY CLIFFS FORMATION: grey dolomite*
	Hab	*ARCTIC BAY FORMATION: black argillaceous limestone; calcareous dolomite*
		EQALULIK GROUP (Hna *to* Has)
	Has	*ADAMS SOUND FORMATION: silica-cemented quartzite*
	Hna	*NAUYAT FORMATION: andesite and basalt, in part amygdaloidal*
	APHEBIAN	
	A	*Granitic and gneissic rocks; mg, migmatite*

Geological Boundary (defined, approximate, assumed)
Fault (defined, assumed)
Traverse Route
Dyke
× 007 Sample Location
Permit Area Boundary
Claim Boundary

MELVILLE PENINSULA

Mapping by Heywood (1967 and 1974) and others (Henderson, 1983; Schau, 1984) show that most of Melville Peninsula is underlain by Archean gneisses, migmatites and foliated to massive granitoid rocks. Among the oldest rocks of the region are folded and metamorphosed sedimentary and volcanic rocks of the Prince Albert Group (Table 4-13). These supracrustal rocks are distributed in two major northeast-trending belts up to 20 km wide and at least 280 km along strike (Fig. 4-13). Clastic metasedimentary rocks mainly derived from greywacke and interbedded with acid to basic metavolcanic rocks with local komatiite or ultrabasics and iron formation, are present mainly in the central part of Melville Peninsula.

A younger, Aphebian or Early Proterozoic sequence of supracrustal rocks, comprising the Penrhyn Group, forms northeast trending bands separated by belts of Archean gneiss and is widely distributed in the southern third of Melville Peninsula (Fig. 4-13). The group is a lithologically varied sequence of pelitic and psammitic gneiss, calcium silicate gneiss, marble, quartzite, and amphibolite (Table 4-13). The Penrhyn Group is complexly folded. Textures and mineral assemblages indicate that Penrhyn Group paragneiss was subject to upper amphibolite grade regional metamorphism after the last penetrative deformation (Henderson, 1983 p. 10).

Along the west coast of Melville Peninsula, near Mackar Inlet, an 800 m thick sequence of weakly metamorphosed arkose and minor phyllite, conglomerate and marble rests unconformably on a metamorphosed regolith developed on Archean basement. Frisch (1982) named this sequence the Folster Lake Formation. Maurice (1979) investigated anomalously high uranium in lake sediment and water samples in this area, found that the granitic rocks are enriched in uranium, particularly near the unconformity and concluded that this unconformity represents an attractive target for uranium exploration.

Much of southern Melville Peninsula was covered by a National Geochemical Reconnaissance survey of lake sediments and waters (Geological Survey of Canada, 1978a, 1978b, 1981b) and an airborne radiometric survey under the aegis of the Uranium Reconnaissance Program (Geological Survey of Canada, 1979). Follow-up work by Cameron (1979) identified strong and coincident zinc and nickel anomalies related to sulphidic-graphitic paragneiss of the Penrhyn Group. Maurice (1979) noted that the lake sediment results show high uranium contents for southern Baffin Island and particularly so for areas underlain by Penrhyn Group rocks.

Iron formation of the Prince Albert Group is widespread, thick and extensive (Shau, 1984) and can be readily traced on aeromagnetic maps. It consists mainly of magnetite and quartz with minor pyrite, hematite and carbonate. Some sections average as much as 30% iron. Rusty-weathering zones or gossans, commonly containing disseminated sulphides, are present in many parts of the region. Most are associated with the metavolcanic rocks of the Prince Albert Group.

The iron formation was systematically explored and staked

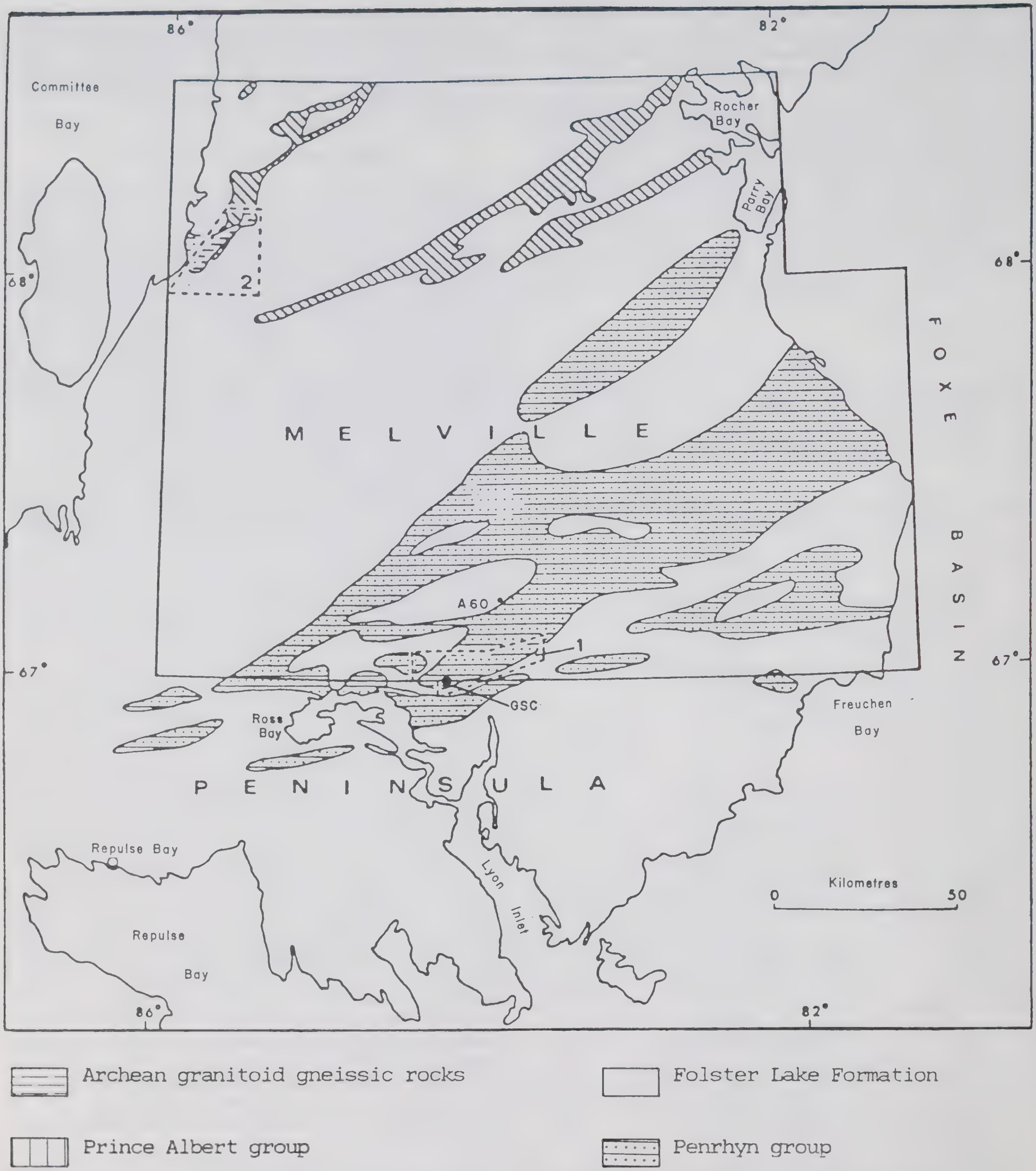

FIGURE 4-13: Regional geology of southern Melville Peninsula showing permit and claim areas of Borealis Exploration Ltd. (from Maurice, 1979).

TABLE 4-13: TABLE OF FORMATION, MELVILLE BASIN (from Henderson, 1983).

AGE	ROCK UNIT	MAP UNIT*	ROCK TYPE
ORDOVICIAN	Bad Cache Rapids Formation	OB	Thinly bedded limestone
Angular unconformity			
NEOHELIKIAN OR HADRYNIAN	Mackenzie or Franklin Intrusions	NHd	Diabase dykes
Intrusive contact			
APHEBIAN	Granite	Ag	Massive aplitic to pegmatitic granitic dykes, sills, and plutons
	Intrusive contact		
	Ultrabasic rocks	Aub	Hornblende peridotite, pyroxenite, metagabbro
	Intrusive contact		
	Penrhyn Group	APqb	Quartzofeldspathic psammitic gneiss
		APn	Pelitic gneiss
		APnc	Massive calcium-silicate gneiss
		APcs	Laminated calcium-silicate gneiss and marble
		APc	Marble
		APm	Massive amphibolite
		APq	Massive quartzite
Angular unconformity			
ARCHEAN OR APHEBIAN		AAm	Amphibolite dykes
Intrusive contact			
ARCHEAN	Granitoid gneisses	Aqdn	Quartz diorite augen gneiss
		Aqmn	Quartz monzonite augen gneiss
		Agdn	Layered granite to granodiorite gneiss
	Intrusive contact		
	Prince Albert Group	AAif	Oxide, silicate, and sulphide iron formation
		AAln	Leucocratic quartzofeldspathic gneiss
		AAm	Fine grained amphibolite gneiss
		AAn	Hornblende-rich paragneiss
	Rocks older than Prince Albert Group were not identified		

by Borealis Exploration Ltd. in the summers of 1969 and 1970 (Wilson and Underhill, 1971; Laporte, 1974a). In 1982, Borealis Exploration Ltd. tested the A and B deposits near Roche Bay with 3,500 m of drilling in anticipation of bringing the deposits into production. In 1983, trace amounts of gold and silver were detected in samples being tested for metallurgical purposes and the 1982 core was relogged and resampled for gold (Gibbins, 1985, p. 135). Aquitaine Company of Canada Ltd. explored 24 prospecting permits in Southern Melville Peninsula between 1970 and 1973. Aquitane's work included several thousand line kilometres of airborne magnetic, EM and radiometric surveys (Laporte, 1974a, 1974b; and Padgham and others 1976).

Cominco Ltd. and Noranda Exploration Ltd. did some mineral exploration on Melville Peninsula in 1979 and 1980 respectively (Gibbins, 1983b and 1984). However, Melville Peninsula has not been the scene of many major mineral exploration projects.

MELVILLE PENINSULA RECONNAISSANCE

Borealis Exploraton Ltd.	Gold, Zinc,
1700 Aquitane Tower	Nickel, Iron
540 - 5th Ave. S.W.	46 N,O,P and 47 A,B
Calgary, Alta., T2P 0M2	67°-69°N,81°30′-86°W

REFERENCES

Cameron (1979); Frisch (1982); Henderson (1983); Heywood (1967, 1974); Maurice (1979); and Schau (1984).

DIAND assessment reports: 081765 to 081768 and 081960 to 081965.

PROPERTY

25 Prospecting permits and various claim groups:

A) PRINCE ALBERT GROUP PROJECT
Group 1 Prospecting Permits 906-909 47 A/3,4
Group 2 Prospecting Permits 910-913 47 A/5
Group 3 Prospecting Permits 1001-1004 47 A/11,14
Group 4 Prospecting Permits 1005-1007 47 B/2,7,8

B) PENRYHN GROUP PROJECT
Group 5 Prospecting Permits 1056-1059 46 P/12
Group 6 Prospecting Permits 1060-1063 46 0/8 P/5
Group 7 Prospecting Permits 1064 and 1065 46 N/1
14 Z1 claims (46 0/1,2); 3 Z2 claims (46 0/4); and 2 Z3 claims (46 0/5,6).

LOCATION

The permits and claim groups are all in central or southern Melville Peninsula (6 in Fig. 4-1).Figure 4-13 shows the location of permit areas and simplified geology.

HISTORY

Prospecting Permits 906-913 were granted in 1983; Permits 1001-1007 were granted in 1984; and Permits 1056-1065 were granted in 1985. Permits 910, 912 and 913 were relinquished in 1985 and Permits 906-908 and 1001, 1003-1005 and 1007 in 1986.

The reconnaissance project and permit acquisition strategy was based mainly on previous mineral exploration on Melville Peninsula. Considerable use has been made of geophysical surveys by Aquitaine Company of Canada Ltd. and the Geological Survey of Canada, and geochemical surveys by the Geological Survey of Canada (Maurice, 1979 and Cameron, 1979) to delineate target areas.

DESCRIPTION

Parts of Melville Peninsula have been mapped and described by Heywood (1967 and 1974), Henderson (1983), Schau (1984) and Frisch (1982). Their work is summarized in the preceeding introduction to Melville Peninsula.

The first four groups of prospecting permits, acquired in 1983 and 1984, are concentrated in areas of Prince Albert Group rocks where gold in iron formation is the principal target. The second group of permits, obtained in 1985, are in areas of Penrhyn Group supracrustal rocks, where gossans and geochemical anomalies may reflect base metal as well as gold-rich deposits (Fig. 4-13).

CURRENT WORK AND RESULTS

Most of the permit areas were prospected on a reconnaissance level in 1984 and/or 1985. An airborne reconnaissance survey identified gossans and other prospective looking areas for follow-up mapping and sampling. In 1984, the field crews included several geologists from Anaconda Canada Exploration Ltd.

Individual groups of prospecting permits and claims are described in the following sections. Only 6 permits were retained in good standing as of April 1, 1986.

PROSPECTING PERMITS 906-909

Borealis Exploration Ltd.	Gold
1700 Aquitane Tower	47 A/3, 4
540 - 5th Ave. S.W.	68°-68°15′N,
Calgary, Alta., T2P 0M2	82°30′-84°W

REFERENCES

Heywood (1967); Schau (1984).
DIAND assessment reports: 081765 and 081965.

PROPERTY

Prospecting Permits 906-909 (Group 1).

LOCATION

Group 1 permits are in central Melville Peninsula 80 to 140 km southwest of Hall Beach and 75 to 135 km east of Mackar Inlet (Fig. 4-13).

HISTORY

The permits were granted February 1, 1983. Permits 906-908 were relinquished in 1986.

DESCRIPTION

A thin band of Prince Albert Group greenstone trends northeasterly through the permit areas (Heywood, 1967 and Schau, 1984). A thin layer of oxide-facies iron formation is contained in meta-volcanic rocks on permits 906 and 907. A discontinuous gossan layer, possibly silicate-facies iron formation, is a short distance to the south.

CURRENT WORK AND RESULTS

In 1984, 48 gossans or otherwise anomalous features were identified from the aerial reconnaissance of this area. Follow-up ground traverses sampled the gossans and defined the local stratigraphic sequence. Traces of pyrite, chalcopyrite and/or arsenopyrite were identified in several of the gossan zones in permit areas 906-908. Large massive quartz veins and pegmatites are common in Permit 906. One sample of quartz vein collected in Permit 906 in 1985 assayed 324 ppb Au and 17.5 ppm Ag. However, a second sample assayed only 25 ppb Au and less than 0.02 ppm Ag. None of the other samples were anomalous.

Prospecting Permit 909 has very little outcrop, although magnetic maps indicate that the greenstone belt crosses it. None of the 22 soil samples collected in this area were anomalous in gold or silver.

PROSPECTING PERMITS 910-913

Borealis Exploration Ltd.	Gold
1700 Aquitane Tower	47 A/5
540 - 5th Ave. S.W.	68°15′-68°30′N,
Calgary, Alta., T2P OM2	83°-89°W

REFERENCES

Heywood (1967); Schau (1984).
DIAND assessment report: 081766.

PROPERTY

Prospecting Permits 910-913 (Group 2).

LOCATION

Group 2 permits are in central Melville Peninsula 15 to 55 km west of Roche Bay and 70 to 110 km east of Mackar Inlet (Fig. 4-13).

HISTORY

The permits were granted in February 1983. All but Permit 911 were relinquished at the end of 1985. NTS area 47 A/5 was previously covered by Prospecting Permit 58, granted to Borealis Exploration Ltd. in 1968.

DESCRIPTION

The area is underlain by a greenstone belt of the Prince Albert Group (Heywood, 1967 and Schau, 1984).

CURRENT WORK AND RESULTS

Gossans were identified on all four permit areas, during the airborne reconnaissance. However, all of the ground follow-up was done in three relatively small areas in Prospecting Permit 911, where gold anomalies are associated with arsenopyrite and pyrite in banded magnetite and sulphide-facies iron formation.

PROSPECTING PERMITS 1001-1004

Borealis Exploration Ltd.	Gold
1700 Aquitane Tower	47 A/11,14
540 - 5th Ave. S.W.	68°30′-69°N,
Calgary, Alta., T2P OM2	82°30′-83°W

REFERENCES

Schau (1984).
DIAND assessment reports: 081767 and 081964.

PROPERTY

Prospecting Permits 1001-1004 (Group 3).

LOCATION

Group 3 permits form a north-trending row of permits, 50 to 70 km west of Hall Beach. They include the westernmost shore of Hall Lake and adjacent area (Fig. 4-13).

HISTORY

The permits were granted February 1, 1984. Only the southern-most permit 1001 (47 A/11 SW) was retained in early 1986.

DESCRIPTION

The area is underlain by Prince Albert Group metavolcanic rocks (Shau, 1984). The permit areas are at the northeastern end of the eastern block of Prince Albert Group where the normal northeast trend is deflected northerly and even north-northwesterly (Fig. 4-13). The area has undergone intense deformation and metamorphism.

CURRENT WORK AND RESULTS

The 1984 aerial reconnaissance indicated most of the gossans to be in permit areas 1001 and 1002. Consequently, the ground follow-up was mainly in these areas, where gold is associated with sulphide-facies iron formation and arsenopyrite. Detailed work in 1985 showed that there are two types of sulphide mineralization. The first consists of disseminated arsenopyrite and pyrite in silicate iron formation and narrow, discontinuous, silicified gossan zones in basalt. The second type consists of pods of massive arsenopyrite within and along contacts of oxide-facies iron formation. Several grab samples from these 1 to 3 m wide pods assayed from 144 to 1380 ppb Au.

Permit areas 1003 and 1004 are underlain mainly by pillow basalt of the Prince Albert Group. Iron formation is very thin when present and economically significant sulphide minerals were not discovered.

Z1, Z2 AND Z3 CLAIMS

Borealis Exploration Ltd.	Zinc, Nickel
1700 Aquitane Tower	46 0/1-6
540 - 5th Ave. S.W.	67°-67°30′N,
Calgary, Alta., T2P OM2	82°50′-83°50′W

REFERENCES

Geological Survey of Canada (1978a,b); Henderson (1983).

PROPERTY

Z1 1-4 in 46 0/1,2; Z2 1-3 in 46 0/4; and Z3 1-2.

LOCATION

The claims are in central southern Melville Peninsula (Fig. 4-13).

HISTORY

The area was covered by regional geochemical surveys in 1977 (Geological Survey of Canada, 1978a,b). The claims were staked in September 1984.

DESCRIPTION

The claims are underlain by metavolcanics and metasediments of the Penrhyn Group (Henderson, 1983 and Fig. 4-13).

CURRENT WORK AND RESULTS

In 1985, the claims were prospected, sampled and partially mapped. There are zinc and nickel anomalies along the contact of graphitic schists with dolomite.

PROSPECTING PERMITS 1005-1007

Borealis Exploration Ltd.	Zinc, Gold, Molybdenum
1700 Aquitane Tower	47 B/2, 7, 8
540 - 5th Ave. S.W.	68°-68°30′N, 85°-85°30′W
Calgary, Alta., T2P OM2	

REFERENCES

Frisch (1982); Geological Survey of Canada (1978a,b); Gibbins (1984); Heywood (1967); Laporte (1974a); Maurice (1979).

DIAND assessment reports: 081768 and 081963.

PROPERTY

Prospecting Permit 1005 47 B/2 SW
Prospecting Permit 1006 47 B/7 NE
Prospecting Permit 1007 47 B/8 NW

LOCATION

The permits are on the west side of central Melville Peninsula, Permit 1005 is 25 to 40 km south of Mackar Inlet, and Permits 1006 and 1007 are 15 to 55 km northeast of Mackar Inlet (Fig. 4-13).

HISTORY

NTS area 47 B/2 was held as Prospecting Permit 83 by Borealis Exploration Ltd. in 1969 and as Prospecting Permit 775 by Noranda Exploration Ltd. from 1981 to 1983 (Laporte, 1974a, Gibbins, 1984). In the past, Aquitaine Company of Canada Ltd. and Noranda Exploration Ltd. have staked claims in the area. Noranda Exploration Ltd.'s BETS claims were discussed by Gibbins (1984, p. 94-90).

The permits were issued February 1, 1984. Permits 1005 and 1007 have been relinquished.

DESCRIPTION

The area, mapped by Heywood (1967) and Frisch (1982), includes Archean gneisses and the Prince Albert Group greenstone sequence, as well as the late Proterozoic Folster Lake Formation sedimentary sequence (Frisch, 1982).

Prospecting Permit 1005 includes most of the known Folster Lake Formation (Fig. 4-13). The Folster Lake Formation is a 800 m thick sequence of meta-arkose that rests unconformably on a metamorphosed regolith developed in Archean basement (Frisch, 1982). Maurice (1978) showed that the basement, which consists of granite and gneiss, is enriched in uranium.

Prospecting Permits 1006 and 1007 contain the northeastern end of the westerly belt of Prince Albert Group (Fig. 4-13).

CURRENT WORK AND RESULTS

Areas for detailed investigation were selected on the basis of a study of all available geological reports and airborne prospecting.

On Permit 1005, a molybdenum showing, discovered and staked by Noranda Exploration Ltd. in 1980 (BETS claims, Gibbins, 1984), was re-examined. The showing, which comprises molybdenite localized along minor fracture zones, is restricted to a much smaller area than previously reported. Borealis Exploration Ltd. also sampled a rust-coloured limonitic gossan developed in volcanics of the Prince Albert Group. Noranda Exploration Ltd. reported a grab sample that assayed 4.8 ppm Au (0.17 oz/ton) (Gibbins, 1984), however, the maximum assay obtained from Borealis Exploration Ltd. samples was 12 ppb Au.

Near the northwest corner of Prospecting Permit 1006, a gossan was sampled to see if it could be related to the anomalous silver content (10 ppm) of a nearby lake sediment sample (Geological Survey of Canada, 1978a). During this work, a sphalerite-bearing frost boil was found south of the anomalous lake. A grab sample assayed 8.50% Zn, 65 ppb Au, 10 ppm Pb and 2 ppm Ag. Detailed work, done in 1985, indicates that the zinc-rich boulder is not typical of the frost heave or local till and must have been transported to its present site. Geological mapping outlined two narrow northwest-trending belts of chlorite schist in the area. Lithogeochemical samples of this unit gave several anomalous nickel contents in the range 112 to 212 ppm.

No ground follow-up was done in Prospecting Permit 1007.

PROSPECTING PERMITS 1056-1059

Borealis Exploration Ltd.	Gold
1700 Aquitane Tower	46 P/12
540 - 5th Ave. S.W.	67°30′-67°37′30″N,
Calgary, Alta., T2P OM2	81°30′-82°W

REFERENCES

Heywood (1967); Geological Survey of Canada (1978b); Laporte (1974a,b).

DIAND assessment report: 089162.

PROPERTY

Prospecting Permit 1056	46 P/12 NE
Prospecting Permit 1057	46 P/12 NW
Prospecting Permit 1058	46 P/12 SE
Prospecting Permit 1059	46 P/12 SW

LOCATION

The permits are near the eastern coast of southern Melville Peninsula (Fig. 4-13). They are 30 to 55 km south of Hall Beach and 220 to 240 km northeast of Repulse Bay.

HISTORY

The area was included in Prospecting Permit 199 issued to Aquitaine Company of Canada in 1970-72 (Laporte 1974a,b).
The present permits were issued February 1, 1985 and relinquished April 1, 1986.

DESCRIPTION

The permit area includes the eastern end of a large belt of Penrhyn Group rocks (Fig. 4-13 and Heywood, 1967).

CURRENT WORK AND RESULTS

Areas of gossan and anomalous arsenic in lake sediments (Geological Survey of Canada, 1978b) were selected for further testing. Except for one sample of arsenopyrite-bearing rock from Prospecting Permit 1059 assaying 490 ppb Au, nothing warranting additional work was discovered in permit areas 1056, 1058 and 1059.

Most of the 1985 follow-up work was centered around a small lake in the center of the southern quarter of Prospecting Permit 1057. The Geological Survey of Canada (1978b) had collected a highly anomalous (220 ppm As) lake sediment sample from this lake. The source of this anomaly was traced to a gossan in pelitic gneiss southwest of the lake. Two samples of this rock have anomalous gold content of 515 and 233 ppb Au. However, other gossans developed in the pelitic gneiss and a marble unit did not contain anomalous quantities of gold.

The best gold assays were obtained from a quartz-pebble conglomerate at the base of a quartzite unit that outcrops as ridges in the southeast corner of the permit area. Pyrite, pyrrhotite and locally arsenopyrite and sphalerite are abundant in the matrix of this basal conglomerate. Gold, zinc, nickel and cobalt anomalies are reported in rock samples from these ridges.

PROSPECTING PERMIT 1060-1063

Borealis Exploration Ltd.	Gold
1700 Aquitane Tower	46 0/8,P/5
540 - 5th Ave. S.W.	67°22′30″-67°30′N
Calgary, Alta., T2P 0M2	81°30′-82°30′W

REFERENCES

Geological Survey of Canada (1978b); Henderson (1983); Heywood (1967); Laporte (1974a, and 1974b).
DIAND assessment report: 081960.

PROPERTY

Prospecting Permit 1060	46 P/5 NE
Prospecting Permit 1061	46 P/5 NW
Prospecting Permit 1062	46 O/8 NE
Prospecting Permit 1063	46 O/8 NW

LOCATION

The permits form an east-trending block near the eastern coast of Melville Peninsula. They are 190 to 230 km northeast of Repulse Bay (Fig. 4-13).

HISTORY

The area was formerly included in Prospecting Permits 190 and 196 granted to Aquitaine Company of Canada Ltd. in April 1970. They flew airborne radiometric, EM and magnetic surveys over this and adjacent areas (Laporte, 1974a and 1974b).
The current permits were issued February 1, 1985 and relinquished April 1, 1986.

DESCRIPTION

The permits are underlain by supracrustal rocks of the Penrhyn Group (Fig. 4-13 and Heywood, 1967). Table 4-13 summarizes lithologic units in the Penrhyn Group.

CURRENT WORK AND RESULTS

Several lakes in Prospecting Permits 1060-1062 have anomalous concentrations of arsenic in their sediments. In 1985, Borealis Exploration Ltd. sampled several gossans in this area but anomalous or encouraging gold levels were not encountered.

A highly anomalous (320 ppm As) lake sediment sample was collected by the Geological Survey of Canada (1978b) in the southeast quarter of Prospecting Permit 1063. However, soil and rock samples, collected in the vicinity of this lake by Borealis Exploration Ltd., did not have anomalous concentrations of gold or silver. They concluded that the arsenic anomaly is related to arsenopyrite mineralization at the contact of a diabase dyke.

South of this lake, several gossans identified by airborne reconnaissance, were sampled. One of these contained a massive arsenopyrite pod 3 m wide in weathered quartzite. This material assayed 2310 ppb Au. The next highest assay was 47 ppb Au from a small (20 cm diameter) pod of arsenopyrite in nearby quartzite.

PROSPECTING PERMITS 1064 and 1065

Borealis Exploration Ltd.	Zinc, Nickel
1700 Aquitane Tower	46 N/1
540 - 5th Ave. S.W.	67°7′30″-67°15′N
Calgary, Alta., T2P OM2	84°-84°30′W

REFERENCES

Cameron (1979); Geological Survey of Canada (1978a and 1978b); Henderson (1983); Laporte (1974a).
DIAND assessment report: 081961.

PROPERTY

Prospecting Permit 1064	46 N/1 NE
Prospecting Permit 1065	46 N/1 NW

LOCATION

The permit area is in central southern Melville Peninsula 16 to 28 km north of the northeast end of Lyon Inlet and 105 to 120 km northeast of the community of Repulse Bay (Fig. 4-13).

HISTORY

NTS area 46 N/1 was covered by Prospecting Permit 180 issued to Aquitaine Company of Canada Ltd. between 1970 and 1972. They identified anomalous radioactivity in the southern half of the area (Laporte, 1974a, p. 123-125).

A 1977 regional lake sediment geochemical survey outlined a number of zinc anomalies in the permit areas (Geological Survey of Canada, 1978a and 1978b). In 1978, Cameron, of the GSC, conducted detailed follow-up work in several of these areas, tracing anomalous base metal readings to their sources by sampling surface waters. He outlined two areas in the permit area that have high zinc and nickel content (Cameron, 1979).

Prospecting Permits 1064 and 1065 were granted February 1985.

DESCRIPTION

The area is underlain by Penrhyn Group supracrustal rocks and Archean granite to granodiorite gneisses (Henderson, 1983 and Table 4-12).

CURRENT WORK AND RESULTS

The 1985 field work was largely confined to the southeast quarter of Prospecting Permit 1064 and the northwest corner of Prospecting Permit 1065 where Cameron (1979) had earlier identified zinc and nickel anomalies in surface water.

Samples of pelitic gneiss from Prospecting Permit 1064 were not enriched in base metals. This was not surprising, as Cameron (1979) pointed out, recent oxidation would have removed any base metal sulphides from the surface. Several soil samples from Permit 1064 did contain anomalous concentration of zinc and nickel. The highest assay was 6,200 ppb Zn, 2,850 ppb Ni and 248 ppb Co.

A soil geochemistry survey of the northwest corner of Prospecting Permit 1065 confirmed the zinc and nickel anomalies of Cameron (1979). One sample assayed 4,400 ppb Zn and 1,160 ppb Ni. The next best sample was less than 500 ppb Zn.

CENTRAL BAFFIN ISLAND

PROSPECTING PERMITS 1103-1105

Petro-Canada Ltd.	Gold
P.O. Box 2844	27 B/12,13
Calgary, Alta., T2P 3E3	68°50′N,71°45′W

REFERENCES

Geological Survey of Canada (1980b to 1981c); Gibbins (1984); Henderson (1982, 1985); Jackson and Taylor (1972); Morgan and others (1975, 1976); Sangster (1981).

DIAND assessment report: 082051.

PROPERTY

Prospecting Permit 1103	27 B/13 NW
Prospecting Permit 1104	27 B/13 SW
Prospecting Permit 1105	27 B/12 NW

LOCATION

The permits cover west-central Baffin Island and lie between the Barnes Ice Cap to the east and the Foxe Basin to the west (in Fig. 4-7). If prior arrangements have been made with the Department of National Defence, Twin Otter aircraft can land at the Longstaff Bluff or Dewar Lakes DEW-line sites in the western and eastern parts of the area.

HISTORY

Cominco Ltd. geologists became interested in the area from maps published by the Geological Survey of Canada (1980b) as part of their National Geochemical Reconnaissance-Uranium Reconnaissance Program and geological reports by Morgan and others (1975 and 1976) and Henderson (1982 and 1985). In 1981, Cominco Ltd. geologists examined an area of Piling Group metasediments that showed high arsenic assays in lake sediment samples collected by the Geological Survey of Canada (1981c). It was felt that the area had some potential for pyrrhotite-arsenopyrite-gold mineralization similar to the Homestake Mine in South Dakota or the Lupin Mine in the District of Mackenzie, NWT. However, prospecting and sampling did not provide encouragement. They also spent a couple of days looking at marble units, believed to be favourable host rocks for Black-Angel-type zinc-lead deposits (Sangster, 1981). The permits were granted February 1, 1986 and relinquished April 1, 1986.

DESCRIPTION

The area is largely underlain by metasediments of the Piling Group known as the Foxe Fold Belt (Jackson and Taylor, 1972). These Aphebian age rocks are typically metamorphosed and complexly deformed. The Foxe Fold Belt stretches westward across central Baffin Island (just south of the Barnes Ice Cap) and extends westward to southern Melville Peninsula, where the meta-sediments are known as the Penrhyn Group, and eastward to western Greenland, where they form the Karrat and Umanak Groups and host the Black Angel deposit. Morgan and others (1975) subdivided the Piling Group into two lithological sequences: quartzite-marble-schist sequence; and metagreywackes and slates.

The lower quartzite-marble-schist sequence wraps around a series of basement culminations that resemble gneiss domes and are situated along the northern margin of the Piling Group. To the south, a thick, well-bedded series of metagreywackes and slates overlie the quartzite-marble-schist sequence. Throughout the greywacke sequence there are a few beds of quartzite, meta-arkose, carbonate rocks, calc-silicate rocks, tuffs and sulphide iron formation.

> Spectacular gossans are ubiquitous within rusty graphitic schists at the top of the quartzite-marble-schist sequence and in the lower part of the metagreywacke-slate sequence in the northern part of the Piling Group. The gossans develop from sulphide facies iron formation, form horizons that range in thickness up to a maximum of 30 m (100 ft), contain pyrite and pyrrhotite (either disseminated or forming massive beds), and give fairly strong magnetic anomalies. Minor amounts of chalcopyrite occur locally.
>
> Marble and calc-silicate gneisses in the attenuated zones of Piling Group rocks north of Flint Lake, locally contain traces of galena (69°20′00″N, 75°10′27″W) and fluorspar (69°20′N, 75°01′48″W). The quartzite-marble-schist sequence also contains traces of galena with minor malachite-azurite stain, south of Flint Lake (69°09′45″N, 74°05′27″W) (Morgan and others, 1975).

CURRENT WORK AND RESULTS

The 1985 exploration program was conducted by a five-person geological crew with helicopter support, based at the Dewar Lakes DEW line site. Work consisted of a detailed lake sediment sampling survey, in the vicinity of lake sediment anomalies outlined by the Geological Survey of Canada (1981c), as well as ground traversing, prospecting, and soil sampling. The 1985 work covered NTS areas 27B, 37A and 37D.

After statistical analysis of the lake sediment data, three clusters of anomalous samples were recognized. The most important cluster or group (71º25'W to 72º05'W and 68º40'N to 69º00'N) contains 22 samples anomalous in arsenic, silver, nickel, copper and lead. The second group is also anomalous in these elements, but the third is anomalous in copper and lead only.

Ground traversing and prospecting led to the discovery of gossans derived from sulphide (pyrrhotite) and oxide facies iron formation, some of which are anomalous arsenic content and may be favourable targets for Lupin-Homestake type gold deposits.

Follow-up work consisting of airborne geophysics and gold geochemistry were recommended for areas of known geochemical anomalies and iron formation.

Prospecting Permits 1103-1105 were granted to Petro-Canada Ltd. on February 1, 1986. This covered an area that coincides with an arsenic-in-lake-sediment anomaly outlined by the Geological Survey of Canada (1981c), as well as the 1985 Petro-Canada Survey.

CARVINGSTONE IN THE ARCTIC ISLANDS

Carvingstone is one of three mineral commodities presently being mined in the Canadian Arctic. Its economic significance is greatly enhanced by value added during local secondary processing, carving. The economic importance of these activities to the northern and national economies is indicated by payments estimated at $10 million divided amoung some 2,000 Inuit carvers in 1981. Transportation, wholesaling and marketing costs add an equal or greater value to the final retail value of goods and services. The cash value of these carvings to the Inuit of the Eastern Arctic was exceeded only by Government wages and transfer payments. Carving is, in many instances, an alternate to unemployment and a source of readily available cash income.

The 1982 economic recession had a devastating effect on the sale and production of Inuit carvings and prints. New initiatives are required to cut costs, improve quality, reduce inventories, and promote an interest and appreciation of Inuit sculptures, if this valuable sector of the Northern economy is to continue to contribute to the welfare and culture of the country (Gibbins, 1984).

The Geology Division of the Department of Indian Affairs and Northern Development has been asked from time to time to assist in the exploration and assessment of potential carvingstone. In 1975, DIAND's Geology Division sponsored a report on carvingstone occurrences in Southern Baffin Island (Hogarth, 1975).

In 1981, the Arctic Islands District Geologist was asked to help find new sources of carvingstone in the Cumberland Peninsula area, near the communities of Pangnirtung and Broughton Island. No new sources were located in this area, although several prospective ultramafic and marble outcrops were examined.

Subsequently, the Arctic Islands District Geologist was asked to examine the Mary River-Nuluujaak Mountain area, where some carvingstone was being quarried. During his visit, Phillip Pitseolak, an Inuit carver from Pond Inlet, discovered a new source of excellent quality carvingstone while prospecting an area of ultrabasic rocks, shown on Geological Survey of Canada Map 1451A, Icebound Lake (Jackson, 1978). The importance of this discovery is demonstrated by the fact that most of the carvings currently being created in Pond Inlet, Clyde River, Hall Beach and Igloolik are made from rock which came from this site.

In 1982-83, the Arctic Islands District Geologist examined areas of carvingstone potential in southern and northern Baffin Island (Hoare Bay and Icebound Lake areas) and Prince of Wales Island (Flexure Bay and Savage Point) (Gibbins, 1985 p. 150-153). This work was continued in 1984 and 1985 and is described in the following sections. The areas are plotted in Figure 4-1, numbers 7 to 12.

In 1984, the author was assisted by carvers, Bart Hanna of Igloolik and Archie Komak of Cambridge Bay. Prof. Don Hogarth of the University of Ottawa accompanied the author to sites in southern Baffin Island in 1985.

INMAN HARBOR

Carvingstone
76 M/16
67º51'N,110º15'W

REFERENCES

Jenness (1922); Fraser (1964).

LOCATION

This carvingstone site is about 3 km west of Inman Harbor (8 in Fig. 4-1), which is about 10 km southwest of the northwest corner of Bathurst Inlet. The site is on the west side of a large outcrop of granite and is difficult to spot.

HISTORY

A number of saw and chisel marks indicate previous working. The site is not active at present, but was known and presumed to be active in the past 25 years (personal communication, Archie Komak, 1984). The rock at this site is true soapstone and is more suitable for lamps (Kudliks) and cooking pots than carvingtone and was presumably used for such, because of its softness, poor colour and polishability.

Jenness (1922, p. 53-54) reported a similar quarry in a large soapstone inclusion in granite near Port Epworth about 70 km west southwest of Inman Harbor.

DESCRIPTION

The area was mapped as granite by the Geological Survey of Canada (Fraser, 1964). The quarry is a large metasomatized ultramafic inclusion in Archean granite.

CURRENT WORK AND RESULTS

The author was led to the site by Archie Komak of Cambridge Bay in July 1984. Poor weather conditions meant that only a few minutes could be spent taking photos and samples.

This is one of the few occurrences of carvingstone in the Northwest Territories that fulfills the definition of soapstone or steatite. Soapstone is defined in the American Geological Institute's Glossary of Geology as: a metamorphic rock of massive, schistose or interlaced fibrous texture and soft, unctuous feel, composed essentially of talc with varying amounts of micas, chlorite, amphibole, pyroxene, etc. and derived from the alteration of ferromagnesian silicate minerals.

Rock from the Inman Harbor site is typically massive with a hint of schistosity. It is dark greenish-grey and appears to have been derived from a coarse grained protolith. Small 2 to 5 mm, darker, chlorite-rich areas are uniformly disseminated through the rock and give the distinct impression of fresh rain drops on the rock.

HOPE BAY

Carvingstone
77 A/3
68°11'N,106°42'W

REFERENCES

Fraser (1964); Gibbins (1986); Gibbins and Hogarth (1986); Seaton (1984); Thorpe (1966, 1972).

LOCATION

Serpentinized peridotite is 0.5 km inland from a small bay on the east side of Hope Bay. This bay is on the west side of a peninsula that projects northward into Melville Sound. Hope Bay falls on a straight line between the communities of Cambridge Bay, 125 km to the northeast and Bay Chimo (Umingmaktok), 75 km to the southwest (9 in Fig. 4-1).

HISTORY

The northern part of the Hope Bay Volcanic Belt has been the focus for mineral exploration by Roberts Mining Ltd. in the late sixties (Thorpe, 1966, 1972) and by Noranda Exploration Ltd. from 1977 to 1983 (Seaton, 1984).

DESCRIPTION

The area of interest is a 300 by 2700 m sill or lens of high magnesium or komatiitic peridotite. This sill intrudes variolitic and pillow basalts of northern Hope Bay Volcanic Belt (Fraser, 1964).

CURRENT WORK AND RESULTS

Carvingstone in this area was brought to the author's attention by Dr. Ulrich Kretschmar who had worked in the area. Carvingstone and peridotite have been noted in mineral exploration reports for the area.

During the summers of 1984 and 1985, the Arctic Islands District Geologist made brief visits to the area and recognized and sampled serpentinized peridotite (Gibbins, 1986). Petrographic and whole rock geochemistry have confirmed the komatiitic nature of the peridotite (Gibbins and Hogarth, 1986). Additional study is in progress.

LONGSTAFF BLUFF RECONNAISSANCE

Carvingstone
(A) 37 A/6, 7
68°30'N, 74°W
(B) 37 C/16
69048'N, 76°25'W

REFERENCES

Jackson and Morgan (1978); Morgan and others (1975); Morgan (in press, a and b).

LOCATION

South Tweedsmuir Island area (A) is 65 to 80 km southeast of Longstaff Bluff and includes the north end of the area north of the mouth of the Nadluarjuk River and numerous small islands in between. The second area (B) is 15 km north of Eqe Bay, about 120 km north-northwest of Longstaff Bluff. Both areas are on west-central Baffin Island (7 in Fig. 4-1).

DESCRIPTION

The South Tweedsmuir Island area (A) is dominated by metamorphosed sediments of the Piling Group, whereas in the Eqe Bay area (B), the Archean Mary River Group prevails (Morgan and others, 1975 and Morgan, in press).

CURRENT WORK AND RESULTS

The primary target area was metamorphosed ultramafic and mafic rocks. The areas chosen for examination were selected from Morgan (in press, a and b) and from a personal communication with Dr. Morgan. One day visits were made to both areas in August 1984.

In the South Tweedsmuir Island area (A), a number of outcrops of metamorphosed mafic and ultramafic lavas were examined. These rocks were too metamorphosed, amphibolite facies or higher, to have good carvingstone potential.

In area (B), north of Eqe Bay, the ultramafic mafic rocks are much more limited in area and are also amphibolite facies or higher.

The 1984 field work was too brief to properly assess the carvingstone potential of the area. However, the relatively high grade of metamorphism in much of the area (Jackson and Morgan, 1978) and the absence of a local native population do not make the region a priority area.

Future work should be directed to ultramafic and mafic rocks in areas of greenschist metamorphism and/or hydrothermal alteration.

ABERDEEN BAY (MARKHAM BAY)

Carvingstone
35 P/16
63º45'41'',72º11º4''W

REFERENCES

Blackadar (1967a); Hogarth (1975).

LOCATION

This occurrence is on the west shore of Aberdeen Bay, near the head or north end of the bay (10 in Fig. 4-1). It is about 150 km northwest of Lake Harbor and 225 km east southeast of Cape Dorset.

HISTORY

The Aberdeen Bay carvingstone sites have been known and used for many years (Hogarth, 1975 and Blackadar, 1967a). The most actively used sites are near tide water and it has become traditional to load raw stone directly onto boats at low tide and refloat the craft with the next tide.

DESCRIPTION

This occurrence is in crystalline limestone or dolomite (Blackadar, 1967a - map unit 8) in contact with pyroxene-hornblende gneiss (map unit 9).

Serpentine marble and calc-silicate rock contain several zones of almost pure, bright, yellow-green serpentine. The serpentine was probably formed by detrital quartz sand or by the action of silica-rich hydrothermal solutions during regional metamorphism of dolomite.

CURRENT WORK AND RESULTS

In 1985, a brief visit was made to examine the carvingstone site. It represents the second major type of carvingstone, those formed by metamorphism of silicated dolomitic limestone to serpentine marble. The Aberdeen Bay sites have survived or been formed by the late phases of regional high-grade metamorphism.

McKELLAR BAY

Carvingstone
25 K/13
62º46'56''N,69º30'58''W

REFERENCES

Hogarth (1975).

LOCATION

This occurrence is on the west shore of a small lake north of McKellar Bay, 20 km east-southeast of Lake Harbor (11 in Fig. 4-1).

HISTORY

This is a well known carvingstone site. It was discovered in the late forties by Suluk Laeta and has been quarried since 1958 (Hogarth, 1975).

DESCRIPTION

Altered (serpentinized) peridotite is quarried from a small ultramafic intrusion in granitic gneisses. Only portions that are completely serpentinized are quarried. The best carvingstone is almost completely altered to dull green serpentine and magnetite. The rock is massive, except for small veinlets of magnetite.

CURRENT WORK AND RESULTS

A brief visit was made to this deposit in 1985 in order to familiarize the author with the geology and confirm its ultramafic nature. This occurrence, as well as the Mary River - Nuluujaak Mountain occurrence (Gibbins 1985), are examples of hydrous serpentinized ultramafic rocks in areas of high grade metamorphic rocks, where if geologic conditions are right. A late or post-metamorphic hydrothermal spring system best explains these local areas of serpentinization.

CLEARWATER FIORD

Carvingstone
26 J/9
66º32'14''N,67º40'20''W

REFERENCES

Hogarth (1975).

LOCATION

This area is on the south shore of Clearwater Fiord, at the northwest end of Cumberland Sound and 100 km northwest of Pangnirtung (12 in Fig. 4-1).

HISTORY

This occurrence was discovered by Jeetaloo Akalukyuk in the summer of 1973 (Hogarth, 1975). It has been the main local source of carvingstone in the Cumberland Sound area, but has not been able to meet the volume requirements of Pangnirtung carvers.

DESCRIPTION

Several narrow alteration zones of dark green chlorite and epidote formed in biotite-microcline-quartz granite. Some of this material is good quality carvingstone, but a lot of unsuitable rock is mixed in with it.

According to Hogarth (1975), the main mineral in this rock is illite, a potassium aluminum silicate, a hydromica or clay mineral.

CURRENT WORK AND RESULTS

In 1985, the Economic Development section of the Government of the Northwest Territories contracted Granite Consulting Ltd. of Surrey, B.C. and several local carvers to excavate rock for carving, remove waste rock and attempt to access more of the good quality rock.

SOUTHERN BAFFIN ISLAND - MICA

Mica, graphite and several other minerals were produced from a number of places in Southern Baffin Island during the first period of European contact in the area. These mineral shipments also served as ballast on whaling ships. The two main areas of activity were near Lake Harbor, where phlogopite is the main mica mineral, and Cumberland Sound, where muscovite and graphite are present.

NIANTE HARBOR

Mica
26 B/15
64°52°N,66°32'W

REFERENCES

Blackadar (1967b); Millward (1930).

LOCATION

The mica pit is about 2 km southwest of the northwest corner of Niante Harbor (also known as Niantaluk) near the center of the southwestern shore of Cumberland Sound (13 in Fig. 4-1). Pangnirtung is about 140 km in a direction 10° east of true north and Frobisher Bay is 165 km to the southwest.

HISTORY

An American citizen, W. A Mentzer, is reported to have mined 13.6 t of mica valued at $120,000 from this site (Blackadar, 1967b; Millward, 1930). A request for a mining licence by Mentzer led directly to the transfer of the Arctic Islands to Canada by Great Britian in 1880.

DESCRIPTION

A pod of pegmatite, in an area about 5 by 10 m, contains large crystals of muscovite mica, feldspar, rose quartz and tourmaline. Most of the large muscovite crystals stock piled at the site consist of herringbone or feather mica, which is marked by three sets of reeves or structural imperfections and are only good for scrap.

The pegmatite is near the contact of Blackadar's (1967b) biotite-quartz-feldspar gneiss and sillimanite gneiss.

CURRENT WORK AND RESULTS

A brief visit was made to the mica pit in August 1985 to determine the geologic setting of the mica and to ascertain whether other possible economic minerals are present. Unusual or rare minerals were not observed. Drill holes in one wall of the pit indicate some later unreported mining efforts.

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CHAPTER 5: KEEWATIN REGION

P.J. Laporte
District Geologist, Keewatin Region

INTRODUCTION

In 1984 and 1985, the District Geologist, Keewatin Region, monitored mineral exploration in the mainland part of the Northwest Territories east of 102°W longitude. The Keewatin Region is part of the Churchill Structural Province of the Canadian Shield. It is underlain by Archean and Aphebian volcanic, sedimentary and plutonic rocks deformed and metamorphosed during the Hudsonian Orogeny. Shallow-dipping to flat-lying, unmetamorphosed to slightly metamorphosed rocks of the Aphebian and Helikian age locally overlie the metamorphic complex south and west of Baker Lake (Fig. 5-1).

In this report, the Keewatin Region has been subdivided into three main areas on the basis of geology and exploration targets (Fig. 5-1): the Ennadai Lake-Rankin Inlet area; the Baker Lake-Thelon River area; and the Chantrey Inlet-Wager Bay area. Most of the properties in the region encompass, or are adjacent to, lakes on which fixed-wing aircraft can land.

CARIBOU PROTECTION MEASURES

The Caribou Protection Measures appended to the land use permits issued in the Keewatin in 1984 and 1985 were the same as the 1983 measures (Laporte, 1985a). Holders of land use permits were forbidden to operate within the Caribou Protection Areas (Fig. 5-2) between May 15 and July 15. However, operations begun before May 15 could be continued, upon approval of the Land Use Inspector, as long as caribou cows were not approaching the area of operation. If cows approached the area of operation, the permittee was to suspend operations and evacuate all personnel except those required for maintenance and protection of the camp facilities. Also, the Land Use Inspector could allow operators to occupy, before July 15, those parts of the Caribou Protection Areas that the caribou cows and calves were not expected to use.

If calving occurred outside the Caribou Protection Areas, permittees were to suspend operations in the areas occupied by cows and calves between May 15 and July 15. Permittees had to suspend blasting, overflights by aircraft at an altitude of less than 300 m above ground level and the use of snowmobiles and all-terrain vehicles in the vicinity of cow-calf aggregations.

Permittees were also forbidden to locate operations and to conduct activities, such as airborne surveys and the movement of equipment, which would interfere with migrating cows. Between May 15 and September 1, permittees could not diamond drill within 5 km of any Designated Crossing and could not construct a camp, cache fuel or conduct any blasting within 10 km of any Designated Crossing.

ENNADAI LAKE-RANKIN INLET AREA

In this area, a complex of granitic gneisses, migmatites and intrusions enclose northeast-trending belts of Archean volcanic flows and pyroclastics, slate, greywacke, conglomerate and minor ironformation. The Archean rocks are unconformably overlain by Aphebian conglomerate, greywacke, quartzite, orthoquartzite, argillite and dolomite which, to the east, are interbedded with and overlain by basaltic flows. During the Hudsonian Orogeny, the Aphebian and Archean rocks were folded about northeasterly axes and intruded by quartz monzonite and granodiorite. Fluorite-bearing granite intruded the Archean-Aphebian complex during the Paleohelikian.

Precious metal deposits within the Archean volcano-sedimentary assemblage are the main targets of mineral exploration in this area.

ERIC SHOWING

Sunmist Energy '84 Inc.	Gold
206, 215 Tenth Ave. SW	55 E/11
Calgary, Alta., T2R OA4	61°34'N, 95°12'W

REFERENCES

Davidson (1970); Laporte (1983b); Thorpe (1972).
DIAND assessment reports: 081787, 081790.

PROPERTY

Prospecting Permit 1025, LAB 2, 3 — 55 E/11 SE

LOCATION

The claims are in the west-central part of Prospecting Permit 1025, which straddles the narrow central reaches of Maguse Lake (Fig. 5-3).

HISTORY

ERIC 1-12 were staked in 1966 to cover a gold showing discovered by Selco Northern Ltd. prospectors. ERIC 13-36 were added to the property in 1967 and the showing was geophysically and geochemically surveyed and probed with six Winkie holes totalling 44.6 m. Prospecting Permit 57 was acquired in 1968. Diamond drilling (1238.4 m in 12 holes), geological mapping, magnetic surveys, geochemical surveys and prospecting done in 1968 (Thorpe, 1972) indicated that the showing was not economic. The ERIC 13-36 lapsed in 1968, Prospecting Permit 57 was relinquished in 1969 and ERIC 1-12 lapsed in 1970.

GOLD 1-6 were staked in 1972 by L.K. Lyttle, who trenched the showing on GOLD 2 and 3 in 1973 and allowed the other claims to lapse. The two remaining GOLD claims were transferred to L. Dempster in 1975.

Mr. Dempster blasted a trench on the showing in 1979 and collected two channel samples containing 471.4 ppm Au over 15 cm and 23.6 ppm Au over 106.7 cm (Laporte, 1983b). GOLD 2 was allowed to lapse.

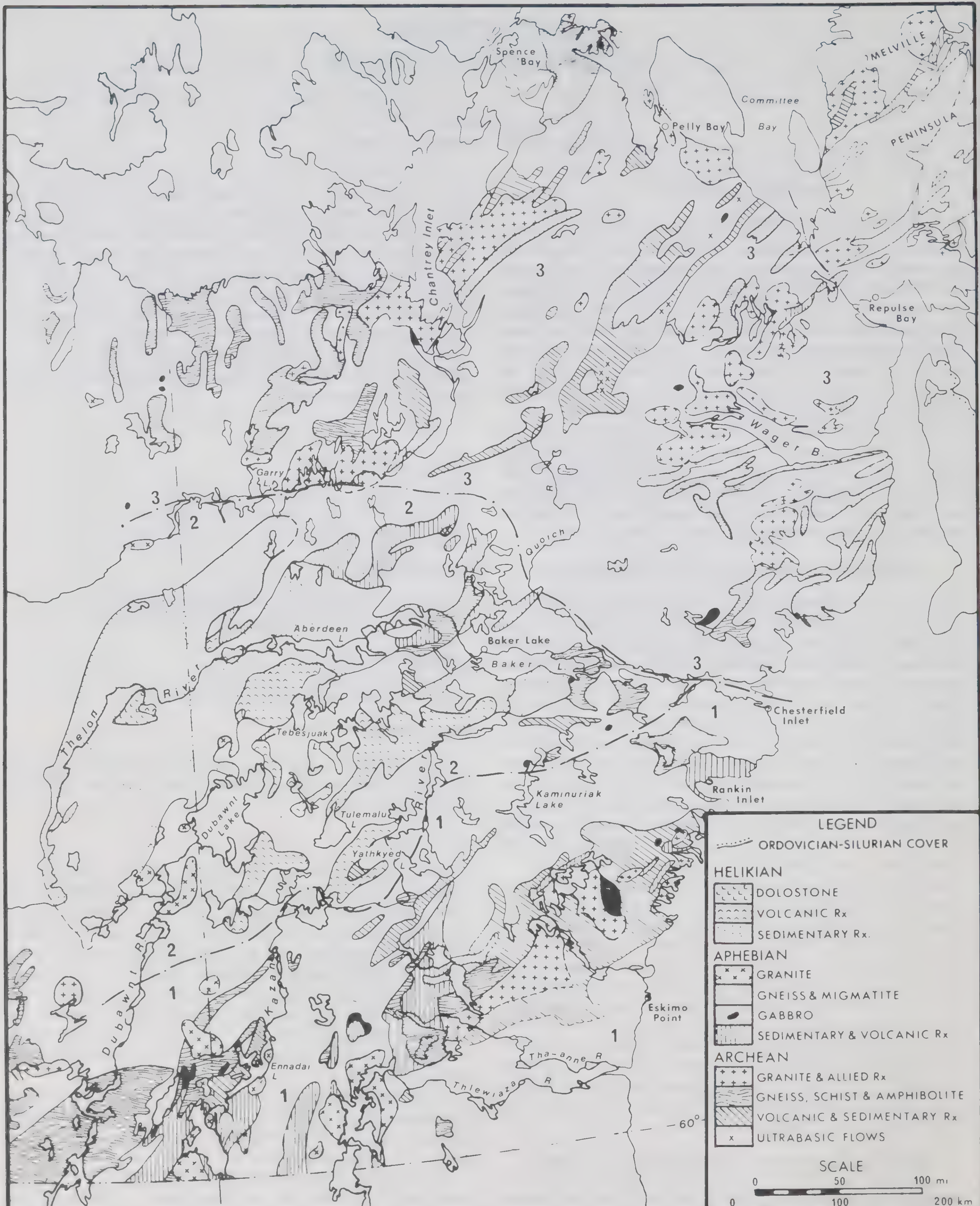


FIGURE 5-1: Geology map of the Keewatin Region showing subdivisions: 1) Ennadai Lake-Rankin Inlet area 2) Baker Lake-Thelon River area 3) Chantrey Inlet-Wager Bay area.

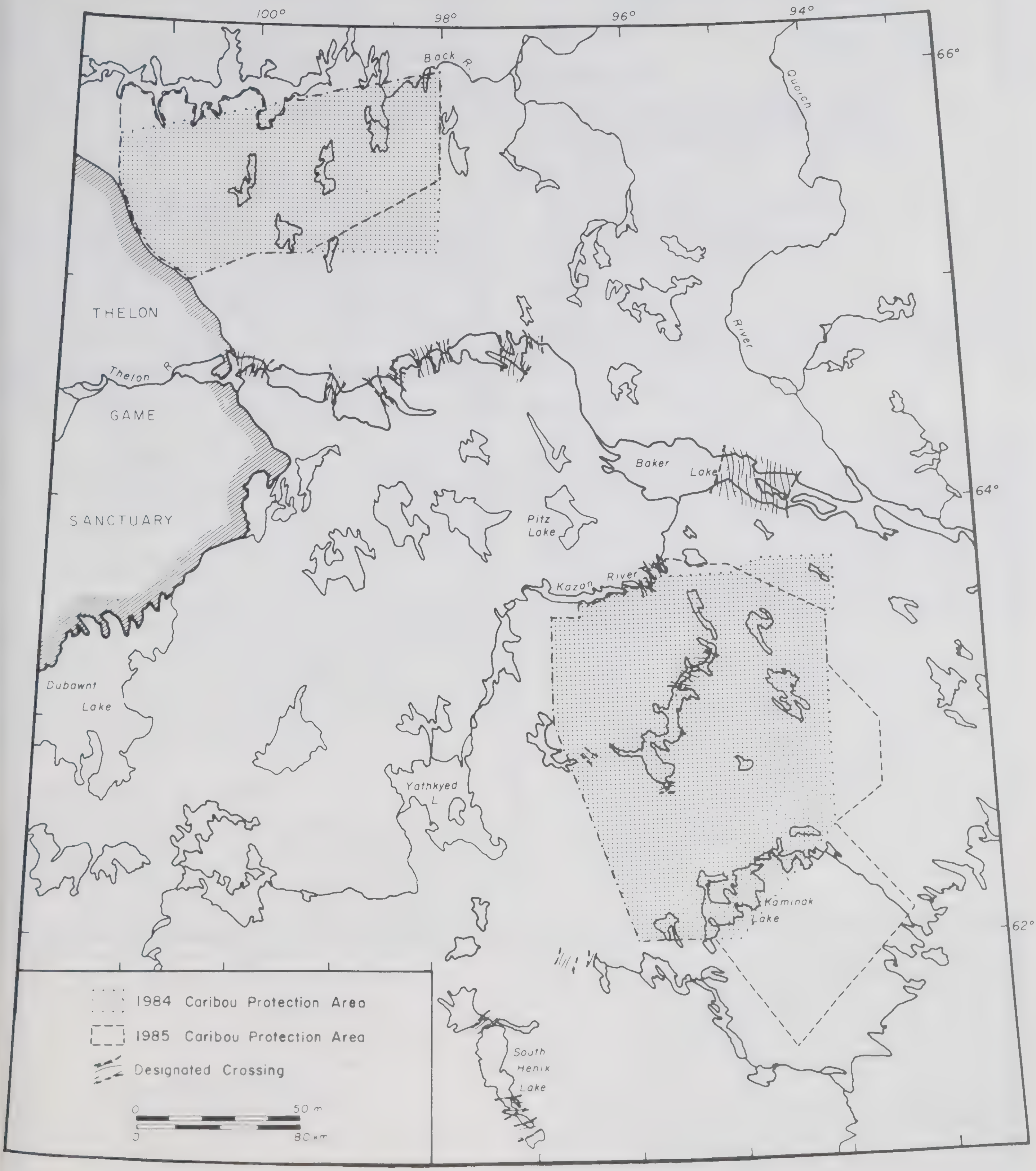
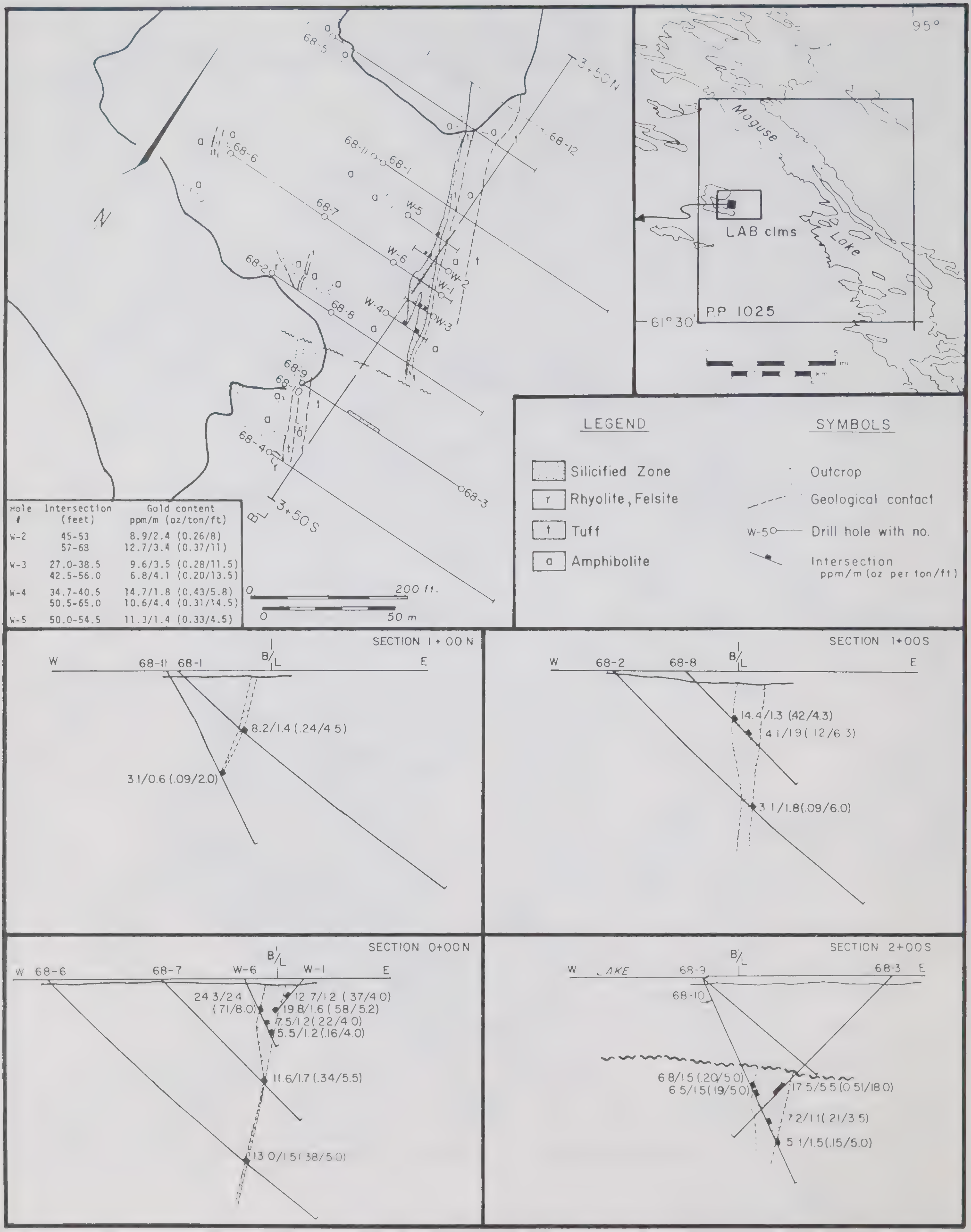


FIGURE 5-2: Extent of areas affected by the Caribou Protection Measures in 1984 and 1985.



Hole #	Intersection (feet)	Gold content ppm/m (oz/ton/ft)
W-2	45-53	8.9/2.4 (0.26/8)
	57-68	12.7/3.4 (0.37/11)
W-3	27.0-38.5	9.6/3.5 (0.28/11.5)
	42.5-56.0	6.8/4.1 (0.20/13.5)
W-4	34.7-40.5	14.7/1.8 (0.43/5.8)
	50.5-65.0	10.6/4.4 (0.31/14.5)
W-5	50.0-54.5	11.3/1.4 (0.33/4.5)

FIGURE 5-3: Geology of the Eric Showing.

In September 1980, J. Londry staked LAB 1 and 2 adjacent to GOLD 3. LAB 3 was staked, in 1982, when GOLD 3 lapsed. LAB 1 lapsed in 1982. In December 1983, LAB 2 and 3 were transferred to Arctic Mining Corporation Ltd. Prospecting Permit 1025 was acquired by Mike Magrum for the Corporation in 1984. In 1985, 141835 Canada Ltd. acquired the prospecting permit and 851846 NWT Ltd., a wholly owned subsidiary, acquired the claims. Sunmist Energy '84 Inc. acquired the property in early 1986.

DESCRIPTION

Prospecting Permit 1025 is underlain by volcanic and sedimentary rocks of the Archean Kaminak Group, intruded in the southwest by Archean hornblende tonalite. Phyllite and schist, derived from the typical Archean greywacke-slate assemblage, underlie the eastern half of the permit area. Magnetite iron formation was observed locally and is deduced, from aeromagnetic data, to form extensive arcuate layers within the metasedimentary package. Mafic volcanic rocks, locally intercalated with more felsic flows and tephra, outcrop along the northern edge of the permit area and to the west in contact with the tonalite intrusion (Davidson, 1970).

The Eric Showing, on LAB 3, is within the mafic volcanic sequence near its contact with the tonalite. Detailed mapping by Selco Northern Ltd. indicates the showing is in amphibolitic andesite enclosing thin layers of metamorphosed rhyolite tuff and flows (Fig. 5-3). The rocks strike north and dip 75° west. Gold is in a zone of secondary silicification in the lower part of an andesite flow underlain by a rhyolite tuff layer 1.5 m thick. The thickness of the silicified zone varies from less than 1 m at the north end to 15.2 m at the south end. Pyrrhotite and minor chalcopyrite, pyrite and sphalerite constitute 5 to 10% of the rock and occur as streaks and lenses in the amphibolite bands and as intergrowths with wall-rock inclusions in the quartz veins. Rare specks of visible gold are present. The distribution of gold is erratic and shows no correlation with quartz and sulphide content of the rocks.

CURRENT WORK AND RESULTS

In 1984, a three-person crew established a grid and prospected the showing. A magnetic survey outlined two parallel magnetic anomalies, one over the showing and the other 100 m to the west. A VLF-EM survey detected two conductors, with poor conductivity, parallel to the strike of the volcanic rocks. The gold-bearing silicified zone was not conductive. Most of the 42 rock samples collected contained less than 5 ppb Au.

IGLOO PROJECT

Canadian Nickel Company Ltd.	Gold
Copper Cliff, Ont.,	55 K/3,6,7
POM INO	65°15'N, 93°00'W

REFERENCES

Heywood (1973); Laporte (1974a,b).
DIAND assessment reports: 081829, 081966.

PROPERTY

Prospecting Permits 1018 and 1019	55 K/3 N
Prospecting Permit 1073	55 K/6 SE
Prospecting Permits 1020 and 1021	55 K/7 S

LOCATION

The property extends along the north shore of Wilson Bay and from the west shore of Mistake Bay to the Ferguson River (Fig. 5-4).

HISTORY

The first reports of exploration work in the area were submitted by Giant Yellowknife Mines Ltd., who held area 55 K/3 as Prospecting Permit 3 from 1961 to 1964, and North Rankin Nickel Mines Ltd., who held areas 55 K/6 and 7 as Prospecting Permits 17 and 18 from 1961 to 1962. Both companies prospected the area and outlined a number of uneconomic gold and copper showings. Giant Yellowknife Mines Ltd. staked and leased claims PEN 1-21 and STEIN 1-8, which cover iron deposits northwest of Mistake Bay, and 18 TORIN claims, covering copper-nickel and copper-gold showings on the Ferguson River.

Husky Oil Ltd. held area 55 K/6 as Prospecting Permit 202 from 1970 to 1973 (Laporte, 1974a,b). Radiometric, electromagnetic and magnetic surveys flown in 1970 and subsequent ground geophysical and geological investigations in 1970 and 1972 failed to detect economic concentrations of metals.

Prospecting Permits 1018 to 1021 were acquired in 1984 to cover anomalous gold concentrations detected during reconnaissance geological and prospecting surveys done in 1983. Prospecting Permit 1073 was acquired in 1985.

DESCRIPTION

Slate, argillite, impure sandstone and greywacke outcrop on the north shore of Mistake Bay and on both shores of Wilson Bay. These sediments enclose extensive arcuate layers of magnetite iron formation and are underlain to the southwest and northwest by mafic volcanic flows and tephra. The sediments and volcanics are part of the Archean Kaminak Group and are intruded, north of Wilson Bay and west of Mistake Bay, by quartz diorite, granodiorite and quartz monzonite plutons.

Aphebian Hurwitz Group rocks, including orthoquartzite of the Kinga Formation, slate and mudstone of the Ameto Formation and feldspathic sandstone to quartzite of the Tavani Formation, outcrop in northeast- to east-trending linear belts in the northern part of the permit areas (Heywood, 1973).

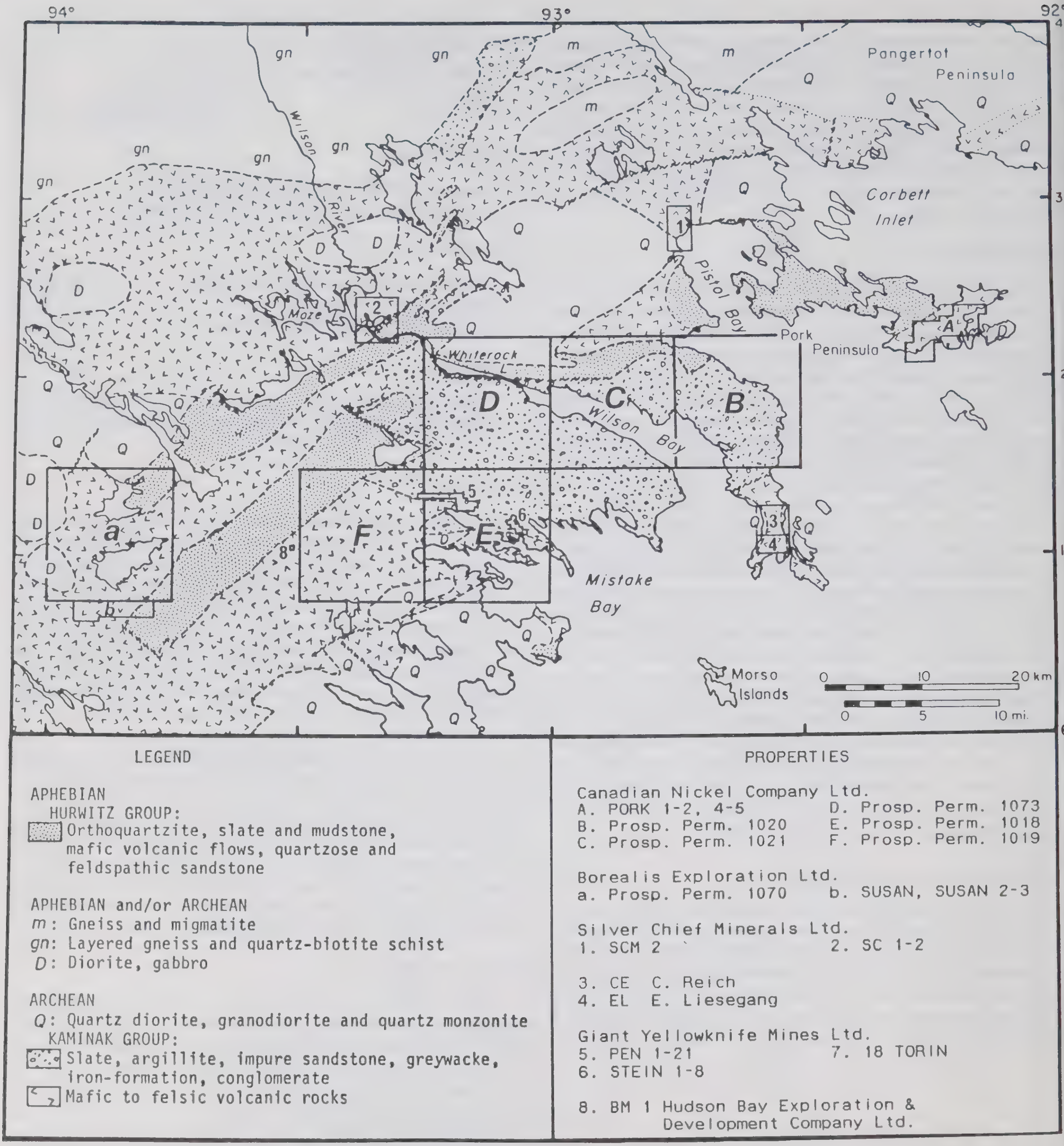


FIGURE 5-4: Geology and properties, Wilson Bay area (geology from Heywood, 1973).

CURRENT WORK AND RESULTS

In July and August of 1984, a four-person crew mapped and prospected the area and performed reconnaissance magnetic and vertical-loop EM surveys over 54 line km of grids. Of the 380 rock samples collected from iron formations, sulphide zones, quartz veins and altered lithologies, 35% contained more than 50 ppb Au. The geophysical surveys outlined conductors previously detected by other companies and traced overburden-covered extensions of iron formation layers. Three gold showings were detected, two in small diorite-gabbro plugs intruding mafic to felsic flows and one in a contorted sulphide-facies iron formation.

In May 1985, a 90 line km grid was established over the iron formation showing and explored with geophysical surveys. The magnetic survey defined the iron formation and outlined three

fold noses within the grid. A 49 line km HLEM survey did not detect any conductors of interest. A till sampling survey of the grid in August outlined several anomalies with concentrations up to 2300 ppb Au.

Prospecting Permit 1073 was prospected in late July and August and found to cover two previously unknown dioritic intrusions. One of the gold-bearing gabbro-diorite plugs outlined in 1984 was explored with IP, magnetic and HLEM surveys, mapping and lithogeochemical sampling. No magnetic or EM anomalies of interest were detected, but the IP survey outlined a few weak to moderate anomalies associated with disseminated sulphides. The gold is in podiform to linear alteration zones along the margin and within the intrusion. The podiform zones are up to tens of metres in diameter and the linear zones are tens of centimetres to several metres wide and up to 30 m long.

The alteration includes silicification, hematization and addition of iron carbonates and up to 10% combined arsenopyrite and pyrite. The enclosing quartz-rich volcanic sandstone and greywacke are also altered and sulphide-bearing near the contact with the diorite-gabbro plug.

KEEWATIN GOLD PROJECT

Borealis Exploration Limited	Gold
1700-540 Fifth Ave. SW	55 K/4
Calgary, Alta., T2P OM2	62°11'N, 93°52'W

REFERENCES

Heywood (1973); Laporte (1974a,b, 1976).
DIAND assessment reports: 017065, 081936, 081959.

PROPERTY

Prospecting Permit 1070	55 K/4 NW
SUSAN 1-3	55 K/4 SW

LOCATION

The property is southwest of Last Lake (Fig. 5-4).

HISTORY

The Last Lake area was first explored by Hudson Bay Mining and Smelting Company Ltd. in the late 1940's. Trenches were blasted on the gold showing but the result of this work was not reported. Newmont Mining Corporation of Canada Ltd. was active in the area in the late 1950's. They acquired the GUN claims west of Last Lake to cover a copper showing.

Area 55 K/4 was then held as Prospecting Permit 4 by Giant Yellowknife Mines Ltd. from 1961 to 1964. Although the maps filed as representation work (report 017065) indicate a gold showing in the area now held as the SUSAN claims, the accompanying reports do not mention this showing.

The first mention of the showing is made in a report prepared for Husky Oil Ltd. who held area 55 K/4 as Prospecting Permit 201 from 1970 to 1973 (Laporte, 1974a,b). Airborne radiometric, magnetic and EM surveys of the area done in 1970 were followed up with prospecting and ground geophysical surveys of anomalies in 1970 and 1972. One of the areas investigated in 1970 was the lapsed REP claims, staked in 1964 by R. Puls, which covered the gold showing. One sample of quartz vein collected from the outcrop contained 17 ppm Au. A second sample of quartz vein with massive pyrite, found at an old campsite, contained 84 ppm Au.

The gold showing was restaked as the IT claims by W.H. Shenton, in April, 1973, and optioned to Denison Mines Ltd. and Coniagas Mines Ltd. (Laporte, 1976). Mapping and prospecting of the claims outlined numerous en echelon quartz-calcite veins near east-trending shear zones. Samples from the veins contained up to 48 ppm Au over 0.6 m.

In 1985, Borealis Exploration Limited, acquired Prospecting Permit 1070 to cover the gold showing on the lapsed REP and IT claims and an untested geophysical conductor on the GUN claims. The SUSAN claims were added to the property during the summer.

DESCRIPTION

East- to northeast-trending mafic volcanic flows and tephra underlie the area west of Last Lake. The volcanics are intruded to the north by quartz diorite, granodiorite and quartz monzonite and to the west by diorite and gabbro. Quartzitic metasediments of the Hurwitz Group (Kinga, Ameto and Tavani Formations) overlie the volcanics in the northeast and southeast corner of the permit area (Heywood, 1973).

CURRENT WORK AND RESULTS

The permit area was prospected, but most of the 1985 exploration was concentrated in the south-central part of the permit and on the adjacent SUSAN claims. A grid was established, surveyed with magnetometer and MaxMin, mapped and prospected. Old trenches, quartz veins and shear zones were sampled and frost boil samples were panned.

Gold concentrations of up to 500 ppm were found in northeast-trending quartz-veined shear zones, 0.3 to 5 m thick and 25 to 300 m long, in andesite and small diorite plugs (Fig. 5-5). These shear zones are subsidiary to major fracture zones up to 70 m wide and 3.5 km long which trend east-northeast. Samples of sheared andesite on the edge of a major fracture zone contained 5 ppm Au.

The shear zones and adjacent rocks are silicified and contain secondary ilmenite, leucoxene and euhedral grains of pyrite, pyrrhotite, chalcopyrite and, locally, arsenopyrite. Visible gold grains, up to 2 mm in diameter, are in calcite-cemented brecciated quartz veins. Gold flakes and nuggets, up to 7 mm in diameter, occur in the oxidized parts of the quartz-calcite veins with hematite, limonite and chlorite. Microscopic gold grains are associated with hematite and chlorite and are inclusions in arsenopyrite.

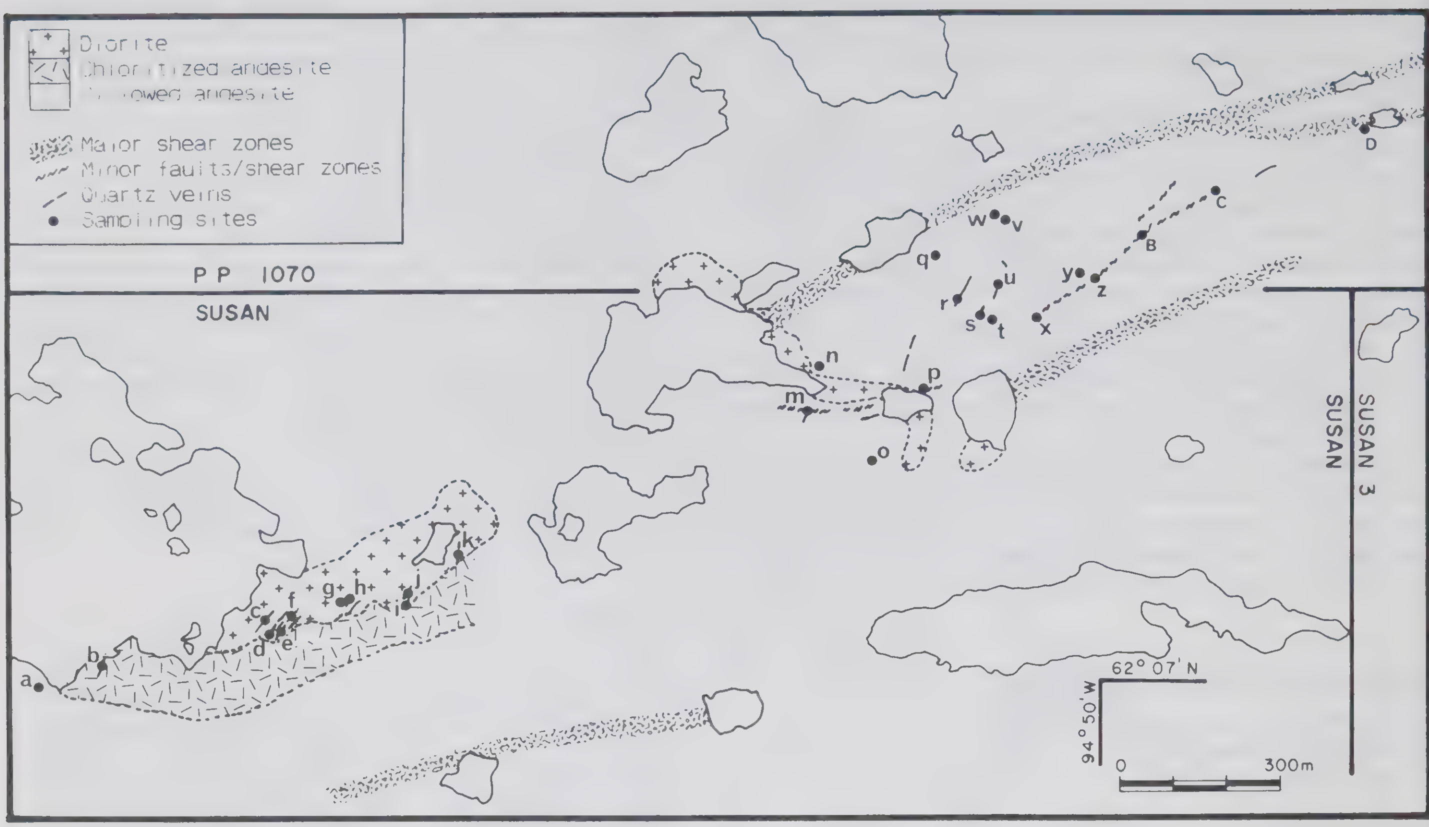


FIGURE 5-5: Geology and sampling results, SUSAN claims.

PORK PENINSULA PROJECT

Canadian Nickel Co. Ltd.	Gold
Copper Cliff, Ont.	55 K/8
P0M 1N0	62°23'N, 92°12'W

REFERENCES

Heywood (1973); Laporte (1985a).
DIAND assessment report: 081919.

PROPERTY

PORK 1,2,4,5 — 55 K/8

LOCATION

The claims extend east across the eastern end of Pork Peninsula (Fig. 5-4).

HISTORY

PORK 1-3 were staked in 1981 to cover a previously trenched but unreported gold showing on the west side of Pork Peninsula and a pyrite-pyrrhotite-chalcopyrite showing indicated on the published geological map of the Tavani area (Heywood, 1973). Samples collected from the trenches in 1981 contained 3.43 ppm Au over 6.09 m, 2.74 ppm Au over 8.84 m and 3.77 ppm Au over 7.82 m. PORK 4 was added to the property in 1982. In 1983, PORK 5 was added to the property and PORK 3 lapsed.

DESCRIPTION

Pork Peninsula consists of a north-facing pile of Archean Kaminak Group pillow basalts and subvolcanic gabbro sills intruded to the southeast by a sheeted dyke complex of diorite and gabbro. The volcanics are overlain, in the northwestern part of the peninsula, by orthoquartzite of the Aphebian Hurwitz Group Kinga Formation (Heywood, 1973).

Geological mapping of the volcanics, in 1982 and 1983, outlined a number of interflow tuffaceous and exhalative layers 1 to 2 m wide and 10 m to 1 km long. The largest layer is 25 to 50 m wide and extends 7 km along the length of the peninsula. The tuffaceous/exhalative bands are foliated sericitic and chloritic schistose zones enclosing chert, iron formation and quartz-carbonate vein-like aggregations. Concordant to subconcordant feldspar-porphyry sills intrude the main tuffaceous band and the adjacent volcanic flows. Gold is associated with pyrite-rich parts of the banded oxide iron formation and pyrite-pyrrhotite concentrations in the quartz-carbonate aggregations. Samples of the main zone contain up to 7.58 ppm Au over 4.5 m (Laporte, 1985a).

CURRENT WORK AND RESULTS

In 1984, a 17 hole (771 m) drill program tested the western 4.6 km portion of the main exhalite zone. Two areas were drilled at 100 m spacing over 700 and 500 m strike lengths and the intervening 1.5 km was tested with four holes. All but one of the holes intersected gold concentrations of over 400 ppb in pyrite-rich iron formation and silicified pyrite-rich zones ad-

SAMPLING RESULTS, SUSAN CLAIMS (Figure 5-5)

Site	Sample #	Type of Sample	Description	Au (ppm)	Ag (ppm)
a	20	grab	Chlorite schist, quartz veinlets, pyrite cubes	2.16	6.31
b	17	grab	Quartz veins with pyrite, chalcopyrite, bornite	6.66	10.50
	60	chip (0.5 m)	Quartz veins with pyrite, chalcopyrite, bornite	1.03	6.38
c	16	grab	Quartz vein with pyrite cubes	33.95	5.49
d	38	chip (0.7 m)	Quartz vein with pyrite cubes	2.58	1.05
e	66	grab	Quartz vein with pyrite cubes	436.81	77.83
	35	chip (0.7 m)	Quartz vein with pyrite cubes	52.80	9.26
	36	chip (0.7 m)	Quartz vein with pyrite cubes	97.72	16.12
	37	chip (0.7 m)	Quartz vein with pyrite cubes	1.36	0.38
f	109	grab	Silicified diorite with minor pyrite	2.06	0.47
	110	grab	Quartz vein with pyrite cubes (1 m from 109)	223.55	NA
	34	chip (0.7 m)	Quartz vein with pyrite cubes	115.20	22.63
g	11	grab	Andesite with trace pyrite	1.00	0.28
h	10	channel (0.6 m)	Andesite with pyrite cubes	1.48	0.45
	12	grab	Quartz vein with pyrite cubes	24.72	4.80
	32	chip (1.5 m)	Quartz vein with pyrite cubes	1.20	0.7
i	15	grab	Quartz vein with galena and chlorite	137.83	31.55
	29	grab	Smoky quartz with pyrite and chalcopyrite	2.40	0.87
	58	chip (0.6 m)	Quartz vein with pyrite and pyrrhotite	82.98	14.75
j	13	grab	Quartz vein in brecciated diorite	44.58	89.15
	14	grab	Chloritized and sericitized diorite	2.03	0.42
k	108	grab	Quartz vein with pyrite, chalcopyrite and galena	99.09	NA
m	8	channel (2.0 m)	Quartz in chloritized andesite	0.48	1.38
n	96	grab	Andesite, possible copper sulphides	4.98	0.9
o	26	grab	Quartz vein with minor sulphides	14.51	4.46
p	7	grab	Smoky quartz with pyrite and arsenopyrite	2.40	0.76
	53	chip (0.5 m)	Gossanous quartz vein with sulphides	152.92	17.15
	54	grab	Gossanous quartz vein with sulphides	29.83	4.80
q	87	grab	Silicified andesite with pyrite	0.86	0.16
r	64	chip (4.0 m)	Quartz vein with altered andesite	1.72	0.45
s	89	grab	Andesite in contact with quartz vein	1.72	0.51
	90	grab	Quartz vein with inclusions of andesite	2.06	0.33
	91	grab	Quartz vein with pyrite	8.40	2.57
	92	grab	Altered oxidized brecciated andesite	48.35	NA
t	95	grab	Quartz-calcite vein with sulphides and inclusions of brecciated andesite	500.58	NA
u	56	chip (0.7 m)	Quartz vein	0.86	0.78
v	24	grab	Quartz vein with pyrite, minor arsenopyrite and andesite fragments	27.95	6.00
w	5	grab	Quartz vein with pyrite	4.67	5.15
x	6	grab	Quartz vein with pyrite	2.64	1.58
y	73	grab	Massive pyrite in quartz vein.	5.49	5.2
z	77	channel (0.5 m)	Quartz-calcite vein with pyrite cubes	1.38	0.43
B	1	grab	Quartz vein with pyrite, chalcopyrite	90.52	13.72
	2	grab	Rusty smoky quartz	216.01	34.98
	3	grab	Chloritized andesite	2.78	0.52
	4	grab	Smoky quartz with pyrite	7.00	4.91
	67	grab	Quartz vein with minor pyrite	365.00	0.22
	68	chip (0.3 m)	Rusty smoky quartz with pyrite	92.58	13.72
	75	grab	Smoky quartz vein with sulphides	17.83	2.85
	85	grab	Smoky quartz vein with sulphides	172.81	NA
C	133	grab	Quartz vein with andesite fragments, chlorite and minor sulphides	3.26	0.48
D	41	grab	Sheared rusty andesite with arsenopyrite and pyrite	4.98	1.92

jacent to the feldspar porphyry intrusions. The highest concentration detected was 12.1 ppm Au over 1.34 m in a silicified zone.

HURWITZ PROJECT

Suncor Inc.	Gold
500 - Fourth Ave. SW	65 B/15,16; G/1-3,6-8
Calgary, Alta., T20 2V5	61°10'N, 98°10'W

REFERENCES

Eade (1973, 1974); Eade and Chandler (1975); Laporte (1984, 1985a).

DIAND assessment reports: 081769, 081805, 081827, 081911, 081947, 081948, 081949, 081950, 082058.

PROPERTY

The properties held by Suncor Inc. are listed in Figure 5-6.

LOCATION

The Hurwitz Project area extends from north of Tatinnai Lake to northwest of Griffin Lake (Fig. 5-6).

HISTORY

Selco Exploration Company Ltd. explored the Cullaton Lake, Mountain Lake and Tatinnai Lake areas in the 1960's and discovered a number of gold showings. One of these showings, the B-Zone Deposit, was brought into production in 1981 by Cullaton Lake Gold Mines Ltd.

Suncor Inc. staked the A to P, BECKY, COR, PETE and ROD claims in 1981 to cover anomalies detected during a 3,560 line km Tridem, magnetic and radiometric survey and a reconnaissance geochemical lake water and sediment survey. Prospecting Permits 826 to 834 and claims 13, A 3-7, DAY, FRI, SPORT, TOO 1-3, WED 1-11 and ZAK 1-4 were acquired in 1982. Prospecting Permits 830 to 834 were relinquished and Prospecting Permit 905 was acquired in 1983. BAR 1-2, DON 1-5, FRANK 1, H 2-3, KEVIN 1-3, MIKE 1-6, PAUL 1-5, RAY 1, SIKSIK and ZAK 5-6 were added to the property in 1983.

Thirty grids were established on geophysical and geochemical anomalies and explored, in 1982 and 1983, with mapping, prospecting, geochemical surveys and magnetic, VLF-EM, MaxMin, HLEM and IP surveys. Nine trenches were dug and 22 holes totalling 1,653 m were drilled on the D Zone, previously explored by Selco Exploration Company Ltd., and other geophysical anomalies. The permits were explored with a lake sediment geochemical survey and a helicopter-borne radiometric survey (Laporte, 1985a).

DEB 1-3, E 2, H 3, J 3-4, JEN 1-6, K 9, RAY 2, ROD 6, SIK 2 and ZAK 5-6 were staked in 1984. Property additions in 1985 were BC 1, DAD 1, KAR 1-5, MIL 1-4, MOM 1, ROD 7 and SIK 3. The JEN claims and most of the claims staked in 1985 cover gold showings north of Tatinnai Lake, which were explored by Hudson Bay Mining and Smelting Company Ltd. and Kasba Explorations Ltd. in the 1940's, drilled by Selco Exploration Company Ltd. in 1966 and 1967 and prospected by Esso Minerals Canada Ltd. in 1981 (Laporte, 1984).

DESCRIPTION

The focus of exploration is a north-northwest-trending, 25 to 50 km wide belt of Archean Henik Group clastic and volcanic rocks. The clastic component of the Henik Group includes greywacke and slate, metagreywacke, pelitic schist and gold-bearing iron formation. The mafic volcanic flows and pyroclastics that underlie these clastic rocks outcrop at the edges of the belt.

The belt is flanked by basins of Aphebian Hurwitz Group sediments. The western basin is a synform with a slightly arcuate axis trending south to the west of Mountain Lake. The eastern basin,which extends from west of Ducker Lake, consists of number of anticlines and synclines disrupted by east-southeast- and north-northwest-trending faults.

The Hurwitz Group has been divided into six formations, five of which outcrop in the area. Conglomerate and greywacke of the basal Padlei Formation are overlain by orthoquartzite and arkose of the Kinga Formation. These are overlain by slate, shale and siltstone of the Ameto Formation, which are in turn overlain by dolomite, argillite, phyllite and siltstone of the Watterson Formation. The top two units of the Hurwitz Group are the Ducker Formation, which does not outcrop in the area, and the Tavani Formation, an assemblage of arkose and impure quartzite, conglomerate and dolomite (Eade, 1973, 1974; Eade and Chandler, 1975).

The main target is gold hosted in sulphide-bearing sections or fracture zones in the iron formation, but the showings north of Tatinnai Lake are in shear zones in volcanics. Visible gold is in quartz and quartz-carbonate veins and stringers along the shear planes and in the adjacent biotite-enriched volcanics. Disseminated arsenopyrite, pyrite, pyrrhotite and traces of chalcopyrite are also present in the volcanics. Drilling by Selco Exploration Company Ltd. on the easternmost Gold Island Showing outlined a branching system of three narrow shear zones at least 61 m and up to 165 m long. Samples assayed up to 57.5 ppm Au over 0.46 m. The westernmost Lothrop No. 2 or Lowo Lake Showing is a 45 m long shear zone with an average content of 13.7 ppm Au over 1.8 m (Laporte, 1984).

CURRENT WORK AND RESULTS

Prospecting Permits 826 and 828 were explored in 1984 with prospecting and, locally, soil sampling. Prospecting Permit 905 was prospected in 1984 and mapped in 1985. Reconnaissance magnetic surveys done in 1984 and a limited soil sampling survey in 1985 failed to detect any anomalies.

A number of geophysical anomalies and geological features on the claims were explored, in 1984, with 520 line km of magnetic and VLF-EM surveys, geological mapping at 1:2500, MaxMin surveys of the better VLF-EM conductors and diamond drilling (26 holes totalling 3690 m; see Table 5-1). The drilling on PAUL 1 and H tested geophysical anomalies caused by quartz-chlorite alteration zones containing pyrite, pyrrhotite, magnetite and up to 16.6 ppm Au over 0.56 m. Two holes on the D Zone tested the iron formation and 2 holes tested a fault zone. The other holes probed fault zones, geophysical anomalies, iron formation and, on PETE 6, a quartz pebble conglomerate but failed to detect gold concentrations of interest.

Further geological, geophysical and geochemical surveys were done in 1985 and 4256.9 m were drilled in 35 holes (Table 5-1). The main drill targets were the alteration zones on PAUL 1

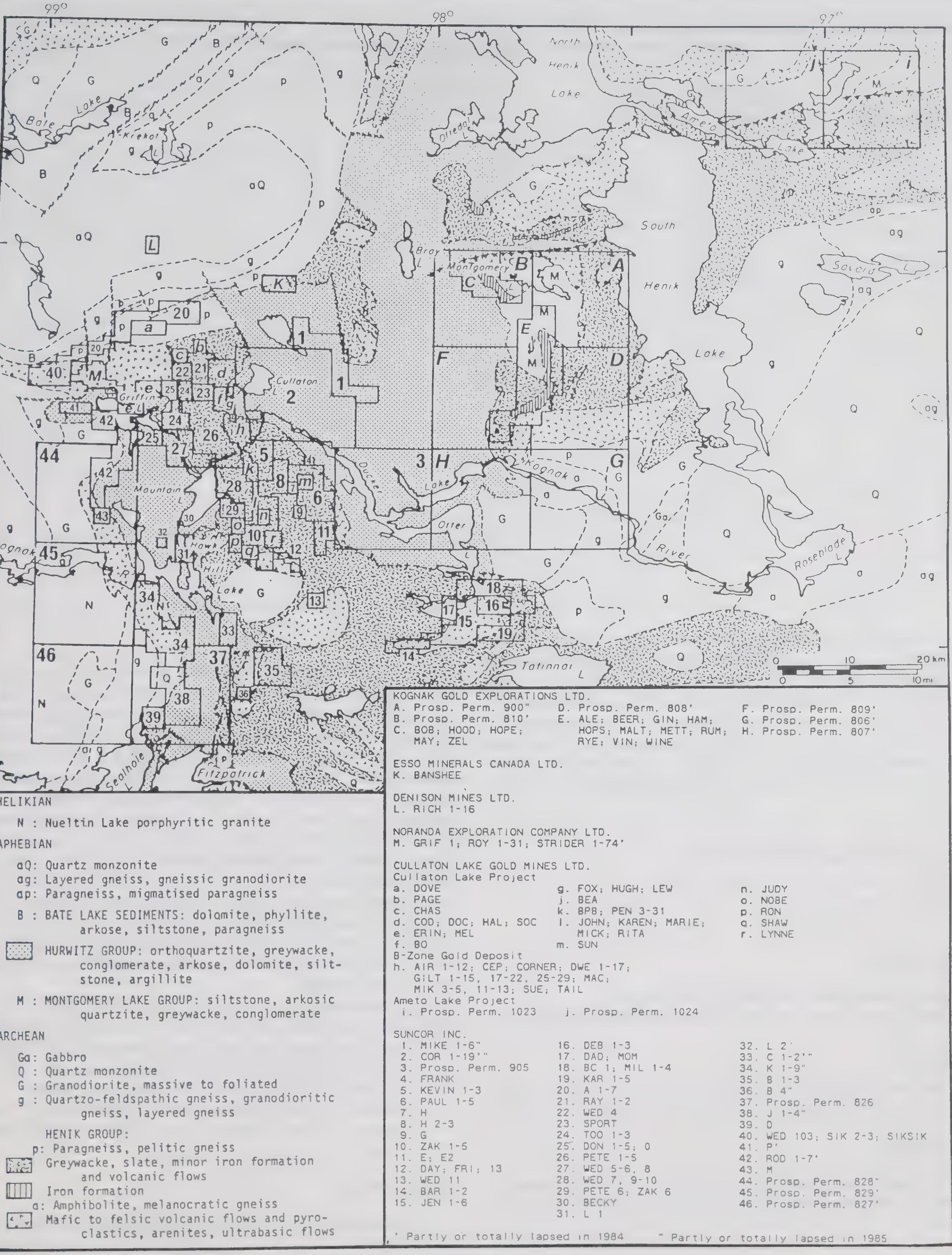


FIGURE 5-6: Geology and properties, Kognak River area (geology from Eade, 1981a).

TABLE 5-1 Hurwitz Project Ground Surveys done in 1984 (o) and 1985 (x)

CLAIMS	GRIDDING (line km)	MAP	PROSPECT	SOIL SAMPLING	BOULDER SAMPLING	MAGNETOMETER	VLF-EM	MAXMIN EM	DRILLING (no./total m)
B 1		o							
B 1, 2	o (6.5)	o				o	o		
BAR 2	o					o	o		o 2/269.8
COR 4, MIKE 1,2	ox (18.2+)		o	o		x	x	o	o 1/139.4
COR 8	ox (29.7)	o		o		ox	ox		
COR 14*	o (22.5)					o	o		
BC 1, DEB 1-3,	ox	ox	ox	o		ox	ox	o	
JEN 2-6* (Tatinnai L.)								ox	o 2/373.1
E E 2	o (34.7)	o		o		o	o		x 23/2600.8
G	o (2.6)	o				o	o	o	
H				o	o				
K 3						o			o 1/145.4
K 4-6	o (37.8)	o			o				
K 8*	x	x	x	x					
KEVIN 1, 2, H 3	o (30.2)	o				o	o		
L 1*	o (34.8)					o	o		
O, TOO 3, DON 1-3				o					
PAUL 1, H*	o (26.3)	o		o		o	o		x 2/369.4
								o	o 7/903.1
PAUL 2, FRANK*	o (25.5)	o				o	o		x 8/1006.5
PETE 1, TOO 1-3	o (174.6)	o		o			o	o	
(D Zone)									o 4/621.8
PETE 3									x 2/370.6
PETE 5, WED 10	o (5.5)	o				o	o		o 1/224.3
PETE 6									
RAY 1*	o (8.1)	o				o	o		o 3/410.9
ROD 3, 4*	x (26.0)	x				x	x		
SIKSIK, SIK 2,3,	ox (31.2)	x		x	x	ox	ox		
WED 3*								o	
TOO 1, WED 4, DON 1	o (62.5)								
(D Zone North)									
WED 7, 10	o (13.0)	o				o	o		
WED 11*	o (32.4)	o				o	o		
ZAK 1	o (12.3)	o				o	o		o 2/360.3
ZAK 3*	o (22.4)	o				o	o	o	o 2/247.8
								o	

* new grids/areas

and H and the gold showings north of Tatinnai Lake. The Tatinnai Lake area was explored with 1:2500 geological mapping, prospecting and 238.8 km of magnetic, 222.9 km of VLF-EM and 10.4 km of MaxMin HLEM surveys. Of the 23 holes drilled, 13 probed the Lowo Lake Showing and 7 probed the Gold Island Showing, and nearby EM conductors. The other three holes tested geophysical conductors between the two showings and failed to detect any gold concentrations (Table 5-2).

CULLATON LAKE PROJECT

Royex Gold Mining Corporation — Gold
1710-141 Adelaide St. W — 65 G/1,2,7,8
Toronto, Ont., M5H 3L5 — 61°13′N, 98°30′W

REFERENCES

Eade (1974); Laporte (1983b, 1984, 1985a).
DIAND assessment reports: 081843, 081844, 081846, 081847.

PROPERTY

The claims, held by Royex Gold Mining Corporation, forming part of the Cullaton Lake Project are listed in Figure 5-6.

LOCATION

The claims are near the B-Zone Gold Deposit, west of Cullaton Lake and east of Mountain Lake (Fig. 5-6).

HISTORY

The Cullaton Lake area was first staked by Selco Exploration Company Ltd. who, from 1961 to 1967, explored a number of gold showings with prospecting, geological and geophysical surveys, boulder and soil sampling, diamond drilling and trenching. Most of the claims listed in Figure 5-6 were staked for O'Brien Energy and Resources Ltd. in 1978 to cover anomalies detected by an EM and magnetic survey flown in 1977. Magnetometer, self potential and boulder sampling surveys, done on the claims in 1979 and 1980, indicated the presence of gold-bearing iron formation on most of the claims. The PEN claims were drilled by Cominco Ltd. in 1979, but no economic concentrations of gold were outlined (Laporte, 1983b, 1984).

Cullaton Lake Gold Mines Ltd. acquired the claims in 1980. BEA, DOVE, HUGH and LEW were recorded in 1981, BPB and MAC in 1982 and DOC, SOC and HAL in 1983. The ERIN claim was staked in 1984.

Grids established on the BEA, BO, CHAS, COD, DOVE, FOX, JUDY, LYNNE, NOBE, PAGE, RON and SHAW claims in 1983 were explored with geological mapping and prospecting, boulder sampling, magnetic, MaxMin and/or VLF-EM surveys. Ten anomalies were drilled (Laporte, 1985a).

Cullaton Lake Gold Mines Ltd. and Royex Sturgex Mining Ltd. merged in May 1984 to form Royex Gold Mining Corporation.

DESCRIPTION

The claims are underlain by greywacke, argillite, phyllite, tuff and magnetic iron formation of the Archean Henik Group. These are overlain, south and west of Cullaton Lake, by in-

TABLE 5-2 Results of Diamond Drilling by Suncor Inc. in the Tatinnai Lake Area

HOLE No.	LOCATION	DIP	CORE SAMPLES Top of intersection (m)	CORE SAMPLES Au (ppm)	CORE SAMPLES Length (m)	SLUDGE SAMPLES Top of intersection (m)	SLUDGE SAMPLES Au (ppm)	SLUDGE SAMPLES Length (m)
GOLD ISLAND SHOWING								
85-DB-11	3+75S 23+55E	-45		N/A		5.19	0.2	6.10
				N/A		29.59	0.7	3.05
			49.88	0.2	0.59	47.89	0.5	6.10
			64.77	2.0	2.78	60.09	0.4	9.14
			83.27	0.4	1.83	84.49	0.9	9.14
			87.41	0.2	3.12			
			99.94	0.5	0.41		Trace	
85-DB-10	3+86S 22+50E	-45	21.61	0.3	0.40		Trace	
			31.89	0.2	0.62	32.64	2.1	3.05
			70.47	8.7	1.77	69.24	2.1	15.24
			77.00	1.7	3.09			
			112.69	0.8	4.74	111.94	0.9	9.14
			129.38	3.7	0.55	127.19	0.1	15.24
85-DB-21	3+55S 21+33E	-45		core not split		8.24	0.3	3.05
				core not split		17.39	0.4	9.14
				core not split		35.69	1.3	6.10
85-DB-22	3+55S 21+32.82E	-48		Trace			not analysed	
85-DB-23	3+24S 19+25E	-45	53.70	0.8	0.78		not analysed	
85-DB-12	3+75S 17+00E	-45	35.58	1.3	1.31	32.64	3.8	27.43
			44.80	0.8	4.74			
			75.29	0.9	2.94	75.34	3.5	3.05
			93.57	1.0	4.63	90.59	0.5	12.19
			113.07	0.2	4.89	111.94	1.4	12.19
85-DB-20	4+30S 16+00E	-45	35.33	0.8	3.46	32.64	0.9	18.29
			69.19	Trace		69.24	0.1	9.14
				core not split		81.44	0.3	15.24
			118.27	12.7	2.89	118.04	5.9	9.14
			140.94	17.5	1.19	142.44	2.6	3.05
			157.84	19.5	0.35	157.69	0.4	27.43
			174.59	1.0	2.01	185.14	Trace	
				core not split		188.19	0.2	15.24
AREA BETWEEN SHOWINGS								
85-DB-13	0+50S 13+50E	-45		Trace			Trace	
85-DB-14	1+00N 10+00E	-45		Trace			Trace	
85-DB-15	0+75S 6+50E	-45		Trace			Trace	
LOWO LAKE SHOWING								
85-DB-19	1+25S 3+00E	-45	13.49	2.0	1.13		Trace	
			26.76	2.0	1.20		Trace	
				core not split		66.19	0.5	3.05
			81.80	6.1	0.20		Trace	
			82.48	5.2	0.24	78.39	0.4	9.14
			83.37	4.7	0.59		Trace	
				core not split		118.04	1.2	9.14
85-DB-18	0+90S 1+00E	-45	17.37	Trace		17.39	0.2	12.19
			78.33	Trace		78.39	0.4	3.05
			83.55	2.0	0.88		Trace	
85-DB-9	1+60S 1+00E	-45	9.13	8.2	0.59	7.32	7.0	3.96
85-DB-3	0+10S 0+25W	-45	9.20	1.5	3.02	8.24	4.9	6.10
85-DB-3A	0+10S 0+25W	-65	14.53	68.3	2.53		no recovery	
85-DB-3B	0+10S 0+25W	-90		no intersection				
85-DB-4	0+50S 0+25W	-45	36.51	7.5	1.35	35.69	2.6	3.05
			55.46	5.1	0.15		no recovery	
85-DB-5	0+41S 0+25W	-45	31.17	2.4	1.83	29.59	14.0	12.19
			33.63	8.7	1.68		no recovery	
85-DB-16	1+00S 0+75W	-45	37.18	11.3	3.44	35.69	4.5	6.09
			48.65	1.6	1.81	41.79	0.4	18.28
				core not split		72.29	0.4	6.09
				core not split		81.44	0.2	6.09
				core not split		151.59	0.2	9.14
85-DB-6	0+10S 1+25W	-65		no intersection				
85-DB-17	1+00S 1+75W	-45	98.79	4.4	0.99		Trace	
85-DB-7	0+50S 2+25W	-45	46.88	0.9	2.69	17.39	0.4	12.19
85-DB-8	0+50S 3+25W	-45	21.97	0.7	0.31	20.44	0.9	3.05
			43.48	0.1	0.85	41.79	1.0	3.05

tensely fractured orthoquartzite and slate of the Aphebian Hurwitz Group (Eade, 1974). Gold is in sulphide-bearing sections of the Archean iron formation and in sulphide-bearing fractures in the orthoquartzite.

CURRENT WORK AND RESULTS

Numerous grids were established on the claims and explored with magnetic, MaxMin, VLF-EM and locally, IP surveys, geological mapping and reverse circulation overburden drilling. Conductive sections of the iron formation layers and some of the VLF-EM conductors in orthoquartzite were probed with 109 diamond drill holes totalling 15,180 m. Gold concentrations were encountered in some holes.

AMETO LAKE PROJECT

Royex Gold Mining Corporation	Gold
1710-141 Adelaide St. W.	65 H/10,11
Toronto, Ont., M5H 3L5	61°42'N, 97°00'W

REFERENCES

Bell (1970, 1971); Eade (1974); Laporte (1974a, 1983b, 1984).
DIAND assessment report: 081810.

PROPERTY

Prospecting Permit 1023	65 H/10 NW
Prospecting Permit 1024	65 H/11 NE

LOCATION

The property extends north and east of Ameto Lake (Fig. 5-6).

HISTORY

Kasba Explorations Ltd. prospected the area in 1948 and discovered a minor gold showing in conglomerate north of Ameto Lake. Selco Exploration Company Ltd. staked the CABIN claims, northeast of Ameto Lake, in late 1960, to cover a gold-bearing pyritic conglomerate horizon. Prospecting Permits 15 and 16, covering NTS areas 65 H/10 and 11, were acquired in 1961. Twenty-one AX holes, totalling 1,136.7 m, and eight X-ray holes, totalling 102.1 m, tested a 4 km length of the conglomerate bed. The conglomerate contained persistent but uneconomic gold concentrations ranging up to 4.7 ppm Au.

Part of the area of Prospecting Permit 1024 was staked for Atlantic Richfield Company in 1969 (Laporte, 1974a). Airborne geophysical surveys and reconnaissance geological work in 1969 outlined numerous anomalies which were explored in 1970 using geochemical lake water and soil surveys and airborne and ground radiometic surveys.

Prospecting Permit 572, covering NTS area 65 H/11 NE, was acquired by Dual Resources Ltd. in 1979 and subsequently optioned by Esso Minerals Canada Ltd. (Laporte, 1983b, 1984). A 110 line km helicopter-borne radiometric survey, reconnaissance lake water and sediment survey, soil survey and prospecting done in 1980 outlined two areas of interest. Re-evaluation of these areas in 1981 indicated they were too small to warrant further work.

Prospecting Permit 1023 and 1024 were granted to Cullaton Lake Gold Mines Ltd. on February 1984. In May 1984, Cullaton Lake Gold Mines Ltd. merged with Royex Sturgex Mining Ltd. to form Royex Gold Mining Corporation.

DESCRIPTION

Volcanic rocks of the Archean Henik Group underlie the northern and eastern parts of the property. The southern part of the permits is underlain by greywacke and discontinuous iron formation, also of the Henik Group. The contact between these two lithologies is covered, in the central and western parts of the area, by an arcuate basin of younger sediments (Eade, 1974).

Northeast of Ameto Lake, the Henik Group rocks are overlain by the Aphebian Montgomery Lake Sediments, arenite and conglomerate. These define the eastern edge of the basin and are overlain by Hurwitz Group rocks including conglomerates of the Padlei Formation, orthoquartzite of the Kinga Formation and siltstone, argillite and gabbro sills of the Ameto Formation. North of Ameto Lake, the Henik Group greywackes are thrust over the Kinga Formation orthoquartzites along the southern margin of the basin (Bell, 1970, 1971).

Archean granodiorite intrudes the volcanics in the northwest corner of the property.

CURRENT WORK AND RESULTS

Those parts of the property underlain by quartzite were mapped and prospected. Of the 134 samples collected, only three contained more than 3.4 ppm Au. Two were from quartz veins and one from a quartz breccia.

SY PROJECT

Abermin Corporation	Gold
1700-1075 West Georgia St.	65 I/4-6
Vancouver, B.C., V6E 3C9	62°22'N, 97°37'W

REFERENCES

Eade (1986); Laporte (1974a,b).
DIAND assessment reports: 081828, 081984.

PROPERTY

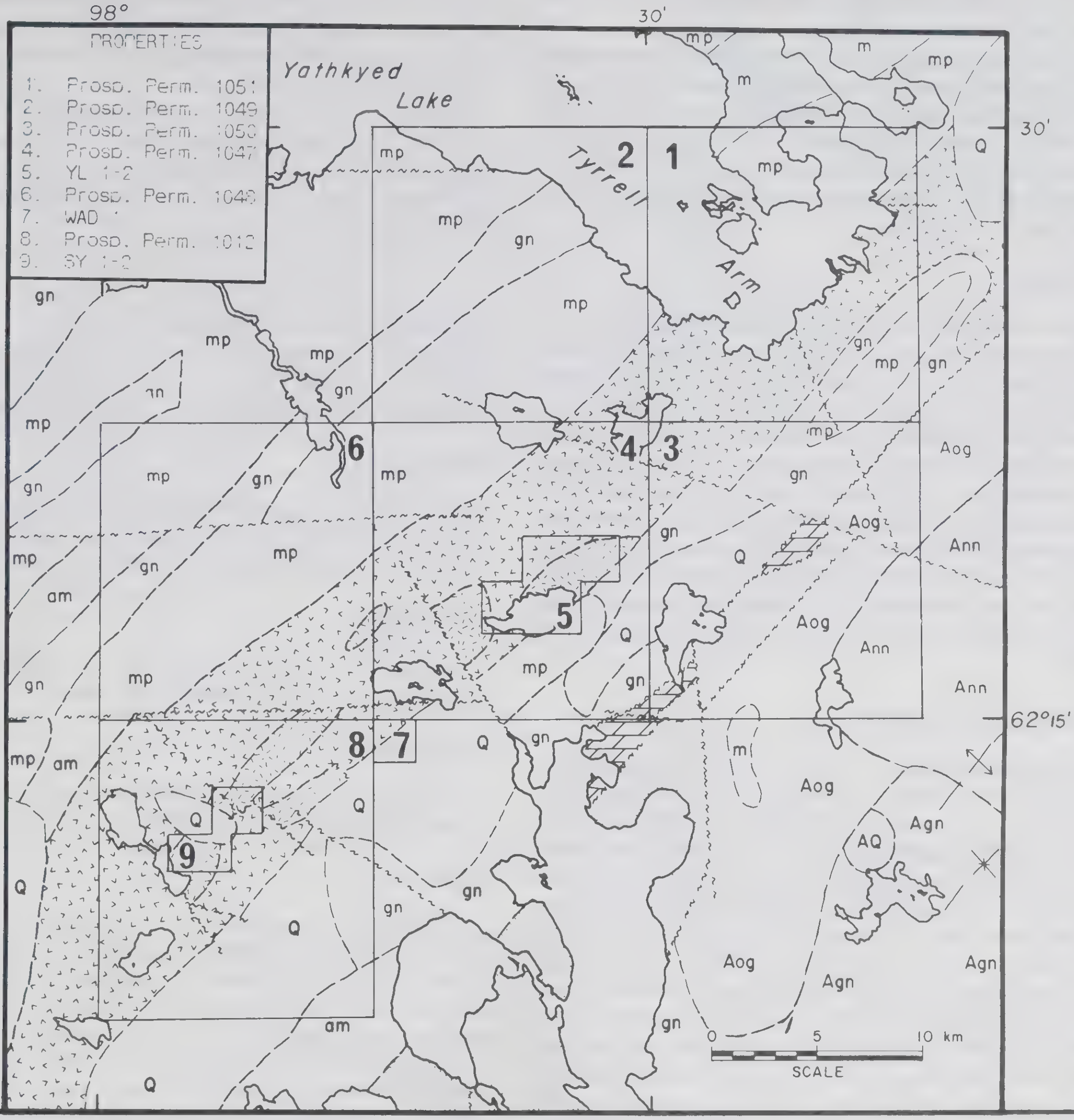
The five claims and six prospecting permits explored are listed in Figure 5-7.

LOCATION

The project area extends southwest from Tyrrell Arm of Yathkyed Lake to northwest of Imikula Lake (Fig. 5-7).

HISTORY

Prudhoe Bay Oils Ltd. held NTS area 65 I/4 as Prospecting Permit 176 from 1969 to 1972. A photogeological and aeromagnetic study of the area delineated five zones of interest that were investigated with ground geological and geophysical surveys in 1970 and 1971. A gossan zone was trenched and samples of volcanic rock containing disseminated pyrite, pyrrhotite and chalcopyrite were collected. The rock contained



APHEBIAN

AQ Quartz monzonite, granite, in past porphyritic; minor syenite, granodiorite and quartz diorite

Aog Orthogneiss, largely biotite quartz-monzonite gneiss with potassium feldspar porphyroblasts; cut by up to 15 per cent dykes and stringers of quartz monzonite and granite pegmatite

Ann Nebulitic and swirled gneiss, in part irregularly layered, predominantly biotite-bearing; contains abundant potassium feldspar porphyroblasts and 20 to 25 per cent quartz monzonite

Agn Layered gneiss to irregularly layered gneiss and agmatite, biotite and hornblende-bearing; some migmatized paragneiss; contains up to 50 per cent dykes, stringers and irregular masses of quartz monzonite

HURWITZ GROUP

TAVANI FORMATION: arkose, meta-arkose, impure quartzite, mica schists

WATTERSON FORMATION: dolomite, phyllite, argillite; and KINGA FORMATION: orthoquartzite

ARCHEAN

Q Quartz monzonite to granodiorite, massive to slightly foliated

gn Granodiorite gneiss, tonalite gneiss and quartz diorite gneiss; includes some orthogneiss, layered gneiss, swirled to nebulitic gneiss and amphibolite inclusions; minor quartz monzonite veins

m Migmatite to irregularly layered, banded, or nebulitic gneiss; minor agmatite; commonly cut by dykes and sheets of quartz monzonite or pegmatite

HENIK GROUP

mp Migmatized paragneiss, amphibolite and granodiorite gneiss

am Predominantly amphibolite; minor amphibolitic greenstone, amphibole schist and gneiss

Intermediate to felsic metavolcanics; tuff, agglomerate, and flows

Basic metavolcanics; massive or pillowed basaltic and andesite flows, pyroclastics, tuff, and agglomerate; minor gabbro and intermediate to felsic flows and tuffs

FIGURE 5-7: Geology and properties, Yathkyed Lake area (geology from Eade, 1986).

up to 0.06% Cu. Eighteen K claims were staked when the permit lapsed and were transferred to Columbian Northland Exploration Ltd. (Laporte, 1974a,b).

Aberford Resources Ltd. became interested in the Imikula Lake area in 1981 as a result of a six-week prospecting campaign. Interesting prospects were staked as the SY 1 and 2 claims in 1983 and Prospecting Permit 1012 was acquired in 1984. The remaining properties were acquired in 1985. The mineral assets of Aberford Resources were transferred to Abermin Corporation in late 1985.

DESCRIPTION

The focus of exploration of the SY Project is an 8 to 10 km wide northeast-trending belt of massive to pillowed basaltic and andesitic flows of the Archean Henik Group. The mafic volcanic rocks enclose intermediate to felsic tuff, agglomerate and flows and chert-magnetite and chert-pyrite iron formation.

To the north and southeast, the volcanic rocks are intruded by quartz monzonite. To the west, they are in contact with migmatized amphibolite. Granodiorite and tonalite gneiss and migmatized paragneiss outcrop along the eastern edge of the belt south of Tyrrell Arm. Hurwitz Group Tavani Formation arkose, meta-arkose, impure quartzite and mica schists overlie the quartz monzonite in the centre of Prospecting Permit 1050 (Eade, 1986).

CURRENT WORK AND RESULTS

The reconnaissance work in 1981 and 1983 indicated that quartz-sulphide iron formation in the SY claims area contained up to 7.1 ppm Au, 4.1 ppm Ag and 2.4% Zn. In 1984, the claim block and surrounding prospecting permit were mapped at 1:5000 and extensively prospected. During these surveys, 376 rock samples were collected and 115 samples from frost boils and trenches were panned. Two grids totalling 79.7 line km were established in the SY claims and explored with VLF-EM and magnetic surveys. Three mini-grids of more closely spaced lines were established in areas of anomalous frost boils and explored with VLF-EM, magnetic and soil geochemical surveys.

An exploration program similar to the 1984 work was done on the newly acquired properties in 1985. It involved mapping and extensive prospecting, with the collection of 329 rock samples and 150 panned concentrates, magnetic and VLF-EM surveys of a grid on the YL claims and geophysical and geochemical surveys on three new mini-grids.

Approximately 20 areas with anomalous gold concentrations were detected over a 32 km length of the volcanic belt. The gold-bearing zones are 0.6 to 4 m wide and contain up to 26 ppm Au. These zones are in cataclastically disrupted segments of the oxide-silicate iron formation and are associated with arsenopyrite, pyrite and pyrrhotite. Narrow VLF-EM conductors with sharp crossovers are associated with the showings.

BAKER LAKE-THELON RIVER AREA

The Baker Lake-Thelon River area is underlain by a complex of gneisses and gneissic to massive granitic intrusions enclosing Archean supracrustal belts near Yathkyed Lake and Baker Lake. Late Aphebian to early Helikian shallow-dipping conglomerates, arkosic sandstone and mudstone, intruded by syenitic bodies and overlain by intermediate to felsic volcanic flows and pyroclastics, cover the basement complex south and southwest of Baker Lake. Flat-lying quartzose conglomerates and sandstones of Paleohelikian age overlie the basement complex in the Thelon River area.

Exploration in the area was for uranium in the basement complex, in Aphebian sediments of the Amer Group and in late Aphebian to early Helikian Dubawnt Group sediments and volcanics. The supracrustal belt north of Baker Lake was explored for gold.

SHANE LAKE PROJECT

Noranda Exploration Co. Ltd.	Uranium
2130 Notre Dame Ave.	55 M/11,14,15
Winnipeg, Man., R3H OK1	63º50'N, 95º02'W

REFERENCES

Blake (1980); Laporte (1983b, 1984, 1985a); LeCheminant and others (1976, 1977); Reinhardt and others (1980).
DIAND assessment report: 081903.

PROPERTY

Figure 5-8 lists the claims held by Noranda Exploration Company Ltd. in the Bissett Lake area.

LOCATION

The property extends southwest from Christopher Island to east of Kazan Falls (Fig. 5-8).

HISTORY

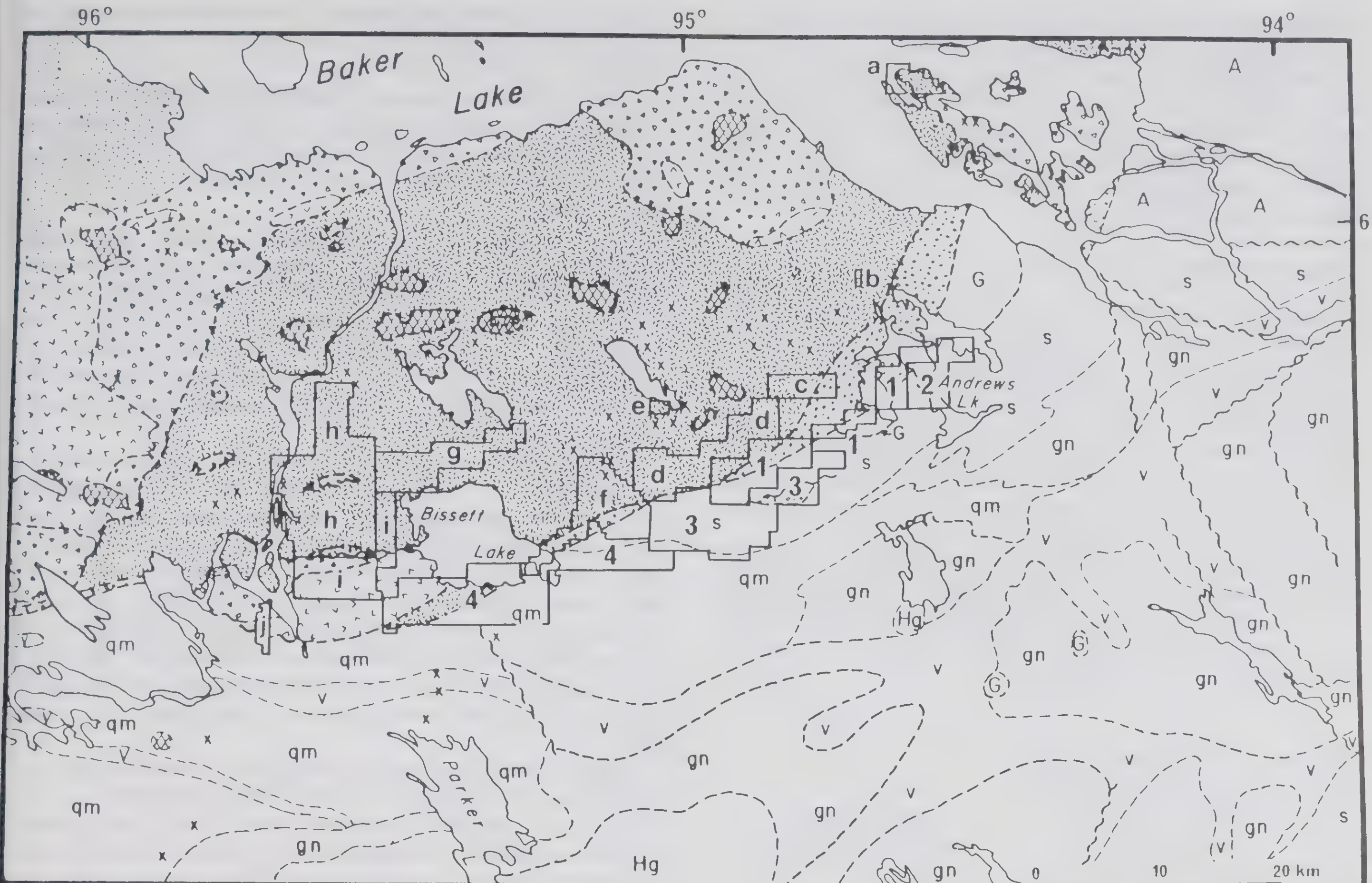
VASO 1-12 were staked in 1978 and A 1-2, MS 1-17 and V 1-14 in 1979. The claims cover ground previously explored as part of the TMT Project by Pan Ocean Oil Ltd. and its precursors between 1969 and 1976. From 1979 to 1981, the property was explored with INPUT surveys, ground geophysical and geochemical surveys, mapping, prospecting and diamond drilling. Holes totalling 846.88 m were drilled on the VASO (8 holes), V (5 holes) and MS claims (3 holes) in 1980 but failed to intersect economic concentrations of uranium. Sixteen more holes totalling 1,217 m were drilled on MS 14 and 15 in 1982 (Laporte, 1983b, 1984, 1985a).

By 1984, two A, seven MS, five V and four VASO claims had lapsed and the area of MS 1,3-5 and VASO 5-10 had been reduced.

DESCRIPTION

The claims cover the unconformity along the eastern and southern edges of the Baker Lake Basin. Dubawnt Group South Channel Formation conglomerate and Kazan Formation arkose outcrop in the western and northern parts of the claim group and overlie Archean and/or Aphebian layered gneiss, gneissic intrusions and metavolcanic and metasedimentary belts (Blake, 1980; LeCheminant and others, 1976, 1977; Reinhardt and others, 1980).

The 1979 and 1981 geophysical surveys outlined 15 conductive zones on the MS, V and VASO claims. The 1980 drilling indicated that conductors on the V and VASO claims are



HELIKIAN
Hg: Granite

DUBAWNT GROUP
Thelon Fm.: sandstone, pebbly sandstone, conglomerate
Martell Syenite: syenite, porphyritic microsyenite, minor monzonite
Christopher Island Fm.: mafic trachyte flows, minor tephra
: volcaniclastic sandstone, siltstone, mudstone, conglomerate, minor tephra
Kazan Fm.: arkose, minor pebbly arkose, conglomerate, siltstone
South Channel Fm.: polymictic conglomerate, sandstone lenses

APHEBIAN AND ARCHEAN
gn: Layered and lit par lit gneiss, migmatite, gneissic granodiorite with inclusions

ARCHEAN
A: Kramanituar High Grade Complex: anorthosite, granulite
qm: Foliated quartz monzonite
s: Greywacke and slate; derived schists and gneisses
v: Volcanic rocks; derived schists and gneisses

PROPERTIES

ABERMIN CORPORATION

a. 50 BL (2-72)
b. D 100-102*
c. D 297-348*o
d. RYAN 6-7,9-12*
e. C 200-205
f. A 1-8; C 34-199
g. C 30-33; PITA 1-150
h. B 1-351,364-370,449-450 K 231-264*
i. BIS 11,21,23,25-27,33*o
j. BIS 32*

NORANDA EXPLORATION COMPANY LTD.

1. VASO 5-12o
2. V 1,2,4
3. V 6-14
4. MS 1,3-8,13-15o

*partly or totally lapsed in 1984
ºpartly or totally lapsed in 1985

FIGURE 5-8: Geology and properties, Bissett Lake area (geology from Blake, 1980; Eade, 1981b and Reinhardt and others, 1980).

caused by barren graphitic chloritic tuffs and metavolcanics of the basement complex (Laporte, 1984a).

The 1982 drilling on the MS claims outlined uranium, copper and silver concentrations in fractured South Channel Formation conglomerate, regolith overlying the basement, and graphitic metasediments of the basement complex. The graphitic metasediments contained up to 2% Cu and 93.6 ppm Ag (Laporte, 1985a).

CURRENT WORK AND RESULTS

Diamond drilling of conductors with coincident Track Etch anomalies resumed on the MS claims in 1984. Three vertical holes totalling 203 m were drilled on MS 3-5 and five vertical holes totalling 291 m were drilled in the vicinity of the metal concentrations on MS 14 and 15. Two of the three holes on the western grid penetrated the basement complex and encountered barren graphitic metasediments. The third hole, 1 km to the west, was stopped in Kazan Formation arkose at 103 m depth.

Of the five holes on the eastern grid, four intersected minor fracture related uranium concentrations in the Dubawnt Group rocks and basement complex. The highest concentration was 0.366% U_3O_8 over 0.5 m in a breccia zone in basement complex metasediments.

TEHEK LAKE PROJECT

Comaplex Resources Internat'l Ltd.	Gold
901, 1015 Fourth St. SW	65 D,E; 66 A,H
Calgary, Alta., T2R 1J4	65º05'N, 95º10'W

REFERENCES

Ashton (1981, 1982); Donaldson (1966); Nadeau (1981); Laporte (1985b); Patterson and LeCheminant(1985); Tella (1984).

DIAND assessment report: 081938.

PROPERTY

The properties are listed in Figure 5-9.

LOCATION

The properties are west and north of Tehek Lake (Fig. 5-9).

HISTORY

MOON 1-2 were staked during a reconnaissance prospecting program in 1983. Prospecting Permit 1077 was acquired in early 1985 and the other claims added to the property in December 1985.

DESCRIPTION

A belt of greywacke, schist, phyllite and argillite trending northeast from the Thelon River extends northwest of Tehek Lake where it is mapped as the Woodburn Lake Group. A slate unit outcropping north of Tehek Lake is probably the stratigraphic equivalent of the greywacke (Donaldson, 1966; Patterson and Le Cheminant, 1985; Tella, 1984).

The Woodburn Lake Group consists of an older sequence of felsic tuffs and rhyolites that grades upward into spinifex-textured ultramafic lavas, felsic to intermediate metavolcanic rocks, banded iron formation and greywacke (Ashton, 1981, 1982).

The stratigraphic position of the white quartzite, which outcrops locally, is poorly understood. Ashton (1982) indicates that the quartzite could be klippens tectonically emplaced from some distance away or could be older or younger than the volcanics.

Extensive layers of iron formation outcrop within the greywacke/slate package in proximity to the volcanic sequence. The iron formation, ranging in composition from quartz-magnetite to quartz-hematite, is often contorted and associated with pyritiferous black slate. In the vicinity of intrusions, the iron formation is metamorphosed to banded and contorted amphibolite and the adjacent slate is metamorphosed to biotite-garnet schist.

Southeast of and in the northwest part of Tehek Lake, the supracrustals are locally altered to biotite-bearing gneisses of the Quoich River Complex. The supracrustals and gneisses are intruded by an Archean granodiorite, north of Tehek Lake, and by the granites of the Tehek Plutonic Complex to the east. Smaller gabbroic and ultramafic plutons outcrop in association with the volcanics northwest of Tehek Lake. Some of these are related to the ultramafic flows and others are younger than the Tehek complex. Syenitic and granitic bodies intruded the plutonic complex and supracrustals in Aphebian times.

A lithogeochemical study of the gold potential of the area undertaken by the author in 1985 outlined five areas of interest in the vicinity of Tehek Lake. Iron formation and gossan samples collected from these areas contained up to 394 ppb Au and one sample of quartz-pyrite veined volcanic rock contained 754 ppb Au (Laporte, 1985b). Sixteen samples were collected from the MOON claims by the author in 1985. The results of this work are presented in Figure 5-10.

CURRENT WORK AND RESULTS

Reconnaissance mapping and prospecting of Prospecting Permit 1077 led to the discovery of four showings within a 1.6 km radius of one another. The Tazin showing is a 2 m wide and 50 m long massive sulphide vein in altered ultramafic flows. Samples of this vein contain pyrite, chalcopyrite, up to 20% arsenopyrite and 6.36 ppm Au. A second thinner and shorter vein, the Stoney showing, cuts granite and consists of chalcocite, chalcopyrite, traces of molybdenite and 29.6 ppm Au.

The Jan showing is a 350 m by 200 m area of fractured and granulated quartz diorite enclosing quartz veins with sphalerite, galena, chalcopyrite, native copper, pyrite and up to 1.64 ppm Au.

The Sheba showing is the most significant. Boulders of sheared, altered and quartz-veined quartz-eye porphyry occur in a 700 m by 300 m area. The 75 samples collected contained up to 140 ppm Au and 680 ppm Ag and averaged 7.36 ppm Au and 67.7 ppm Ag. A soil geochemical survey of the area outlined two broad areas with anomalous metal concentrations, neither of which correspond directly with the area of boulders.

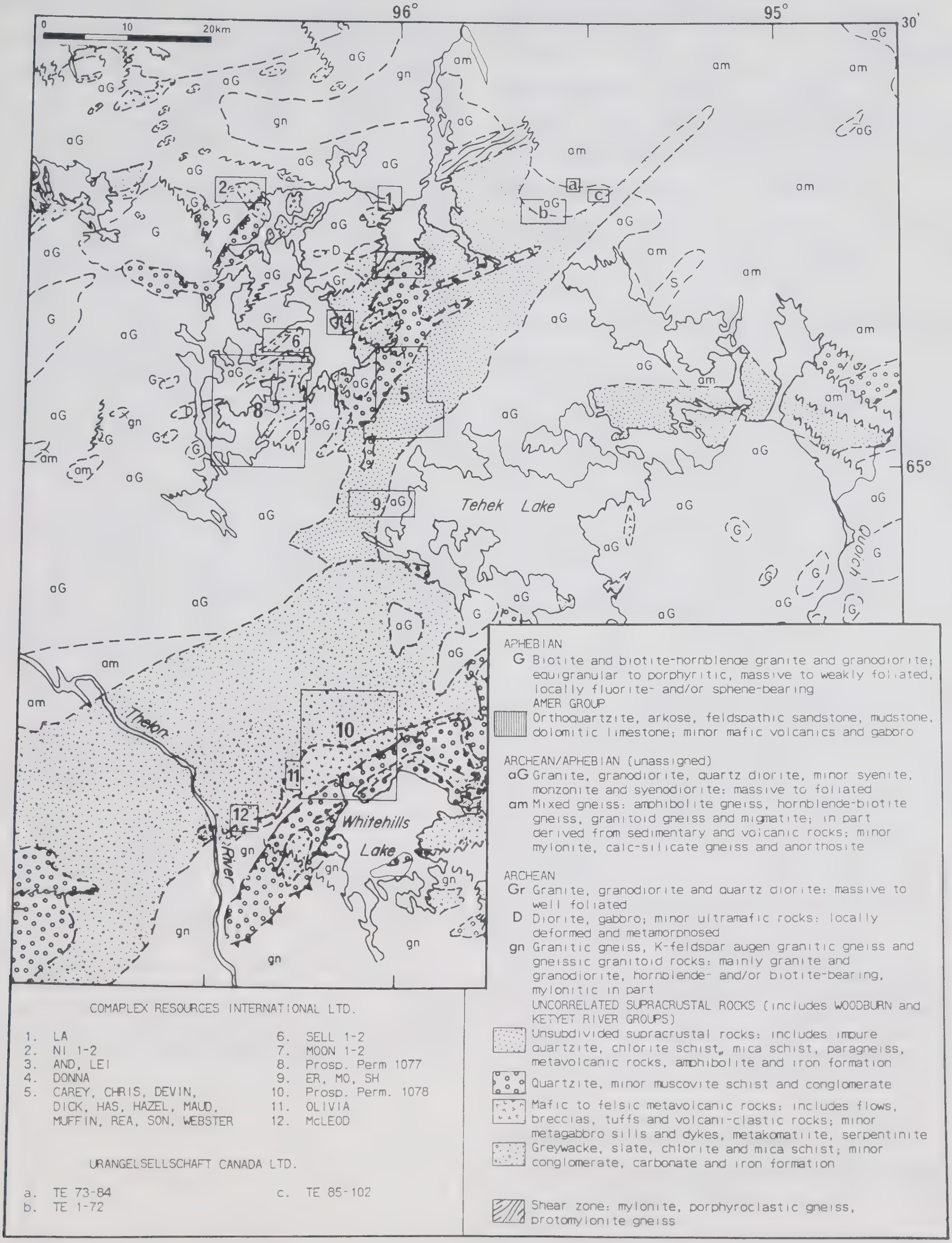


FIGURE 5-9: Geology and properties, Tehek and Whitehills Lakes area (geology from Patterson and LeCheminant, 1985).

SAMPLING RESULTS FOR MOON CLAIMS

Site No.	Description	Sample No.	Au (ppb)	Ag (ppm)	Cu (ppm)	Pb (ppm)	Zn (ppm)	Ni (ppm)	As (ppm)
L1 f.h.	quartz-veined diorite								
	minor pyrite in quartz veins	L1	29	0.5	52	6	29	10	
	gossanous quartz veins	L2	187	7.1	1260	11	63	35	
L2 f.h.	quartz vein over 3 m width								
	minor sulphides in quartz vein	L3	651	16.1	200	61	16	8	
L3	quartz vein fragments on edge of outcrop								
	disseminated to massive sulphide	L4	91	15.4	352	520	148	40	31
L4 o.c.	quartz veins in sheared gossanous felsic volcanics (metasediments)								
	quartz eyes in med. grained volcanic	L5	77	0.6	23				
	composite of grab samples over 5 m from sulphide-bearing fine grained schist	L9	1611	7.9	196	0.22%	83	7	227
	fine grained quartz and sulphide rich schistose volcanic	L10	6000	15.9	1480	0.14%	0.18%	20	88
L5 o.c.	barren quartz vein in coarse felsic volcanic or intrusive	L11	29	0.3	6				
L6 o.c.	same quartz vein as at L5								
L7 f.h.	Treasure Trench area: numerous sulphide-bearing gossanous quartz veins/pods in schistose quartz-eye tuffs								
	quartz vein with galena, sphalerite and pyrite	L13	34286	103.0	446	9.3%	0.36%	10	48
	quartz vein with galena & pyrite	L14	18857	58.3	0.46%	1.98%	0.12%	18	148
	quartz eye tuff	L15	1268	0.6	20	40	27	8	28
	gossanous schistose tuff	L16	171	1.2	10	0.12%	310	4	26
L8 o.c.	amphibolite and amphibole gneiss (felsic volcanic)								
L9 o.c.	10 m wide and 50-65 m long gossan in quartz-magnetite iron fm								
	composite of grab sample from coarse grained iron formation in 10 by 35 m area	L18	36	0.8	26	34	16	0.07%	20
	finely banded iron formation with sulphides	L20	24	0.3	128	23	48	0.12%	4
L10 o.c.	iron formation pinches out between mafic and felsic volcanics								
	iron formation with approximately 10% pyrite	L22	74	1.7	336	38	47	0.04%	5
L11 o.c.	granodiorite								
L12 o.c.	quartzite metasediments which grades to the north into gossanous pyritic metasediments or iron formation, rock is cut by granodiorite dykes								
	composite of grab samples from 15 to 20 m zone of gossanous material	L25	53	0.5	54	18	197	0.09%	3

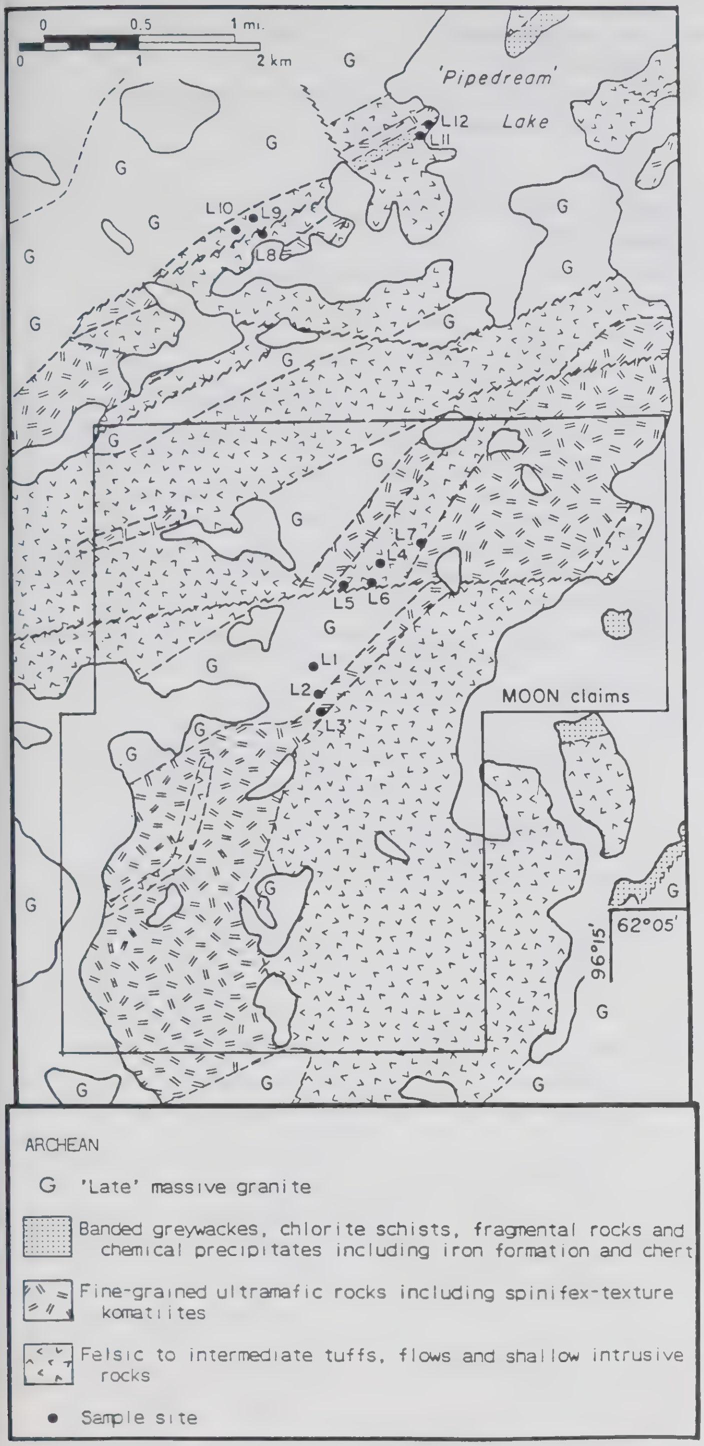


FIGURE 5-10: Geology and results of author's sampling, MOON claims.

AMER-WOODBURN PROJECT

Urangesellschaft Canada Ltd. — Uranium
3100, 2 Bloor St. E — 56 E/5,6
Toronto, Ont., M4W 1A8 — 65°18'N, 95°35'W

REFERENCES

Ashton (1981, 1982); Laporte (1983a,b); Patterson and LeCheminant (1985).

PROPERTY

TE 1-84	56 E/5
TE 85-102	56 E/6

LOCATION

The claims are 25 km north of Tehek Lake (Fig. 5-9).

HISTORY

In 1978, Urangesellschaft Canada Ltd. acquired Prospecting Permits 483 to 487, 490 and 491. Airborne radiometric and VLF-EM surveys, mapping and prospecting in 1978 and 1979 lead to the discovery of ten uranium showings. The showings were explored with detailed mapping and prospecting, magnetic, radiometric and VLF-EM surveys, mud-boil and A_0 horizon soil geochemical surveys and trenching (Laporte, 1983a,b). Four HI, 87 HEK and 102 TE claims were staked to cover the showings in October,1980. The permits lapsed in early 1981 and the HI and HEK claims lapsed in early 1983. The TE 1-84 claims lapsed in 1985 and 1986.

DESCRIPTION

The project investigated the potential of a northeast-trending sequence of supracrustal rocks including quartzite, chlorite and mica schists, paragneiss, metavolcanic rocks, amphibolite and iron formation (Patterson and LeCheminant, 1985). Detailed mapping of the western outcrops by Ashton (1981, 1982) indicated that the supracrustal rocks, informally named the "Woodburn Lake Group", include an older sequence of felsic tuffs and rhyolites that grades upward into komatiites, felsic to intermediate metavolcanic rocks, banded iron formation and greywacke. Conglomeratic quartzite of uncertain age outcrops in the eastern parts of the area. The supracrustals are intruded to the south and north by granitic masses and extend to the northeast into mixed gneiss.

Four types of uranium showings were recognized: extensive, low-grade, possibly syngenetic, pitchblende disseminations in dirty metasediments; fracture-related uranium concentrations in orthoquartzite; radioactive concentrations in pyritic quartz-pebble conglomerate; and discontinuous radioactive mineral concentrations along the contact of intrusive granite and dirty quartzite.

CURRENT WORK AND RESULTS

A two-person prospecting crew investigated the gold potential of the TE claims in 1985.

LONE GULL DEPOSIT

Urangesellschaft Canada Ltd.	Uranium
3100, 2 Bloor St. E	66 A/5
Toronto, Ont., M4W 1A8	64°27′N, 96°37′W

REFERENCES

Fuchs and others (1982); Laporte (1985a).
DIAND assessment reports: 061351 to 061355.

PROPERTY

L 1-620 and SSL 1-128.

LOCATION

The claims are north of Judge Sissons Lake (Fig. 5-11).

HISTORY

The Lone Gull Deposit was discovered in 1974 during an airborne radiometric survey conducted by Metallgesellschaft Canada Ltd. on their Prospecting Permits 317 to 327. Two isolated anomalies were discovered 750 m apart on Prospecting Permit 318. The western anomaly corresponded to frost boils containing chips of metasediments coated with yellow,secondary uranium minerals. The eastern anomaly corresponded to grass-covered hummocky terrain near an outcrop of orthoquartzite. The L and SSL claims were staked in 1976 and Prospecting Permit 318 lapsed in 1977.

From 1975 to 1984, most of the claims were explored with a number of geochemical and geophysical surveys (Fuchs and others, 1982). Diamond drilling, begun in 1977, has identified three main uranium concentrations in arkosic sediments: the Main, Centre and Eastern or "46 E" Zones. By the end of 1983, drilling totalled 12,013 m in 77 holes on the Main Zone, 5323 m in 47 holes on the Centre Zone and 4314 m in 40 holes on the Eastern Zone. Fifty-five holes, totalling 6797 m, were drilled on other anomalies and showings on the claims between 1979 and 1983 (Laporte, 1985a).

DESCRIPTION

The Lone Gull Deposit is in a sequence of arkosic quartzites and metapelites. The sequence includes garnetiferous impure quartzites, mafic chloritic metasediments, possibly of tuffaceous origin, and well-laminated siliceous beds. It is overlain by white orthoquartzite and underlain by greywacke. Granite, quartz-feldspar porphyry, lamprophyre, syenite and a diabase dyke intrude the metasediments on the Lone Gull grid.

Most of the uranium concentrations are in fracture zones and all have a well-defined alteration envelope. In the less altered rocks, chlorite, hematite and limonite formed along fractures. The more altered rocks are characterized by pervasive clay alteration (illite) with lesser chlorite, sericite, talc, hematite and limonite. The presence or absence of specific phyllosilicates is partly dependent on lithology; sericite is more common in the orthoquartzite and the underlying impure quartzite, but illite is common in the feldspathic quartzites. The chlorite may be an alteration of mafic-rich layers. The distribution of hematite and limonite is independent of other secondary minerals and probably reflects local reduction potential and permeability conditions. Pitchblende is commonly associated with limonite and

HELIKIAN
Diabase dykes
DUBAWNT GROUP
Thelon Formation: conglomerate and sandstone
Quartz-hematite breccia

APHEBIAN
Fluorite-bearing granite, syenite

ARCHEAN(?)
M Monzonite
D Diorite
ag Augen gneiss
Gr Quartz diorite to granodiorite
bg Biotite gneiss (derived from sediments)
a Amphibolite (derived from mafic volcanics and dykes)
Felsic flows and tuffs
Orthoquartzite, laminated, sericitic and pyritic quartzite, quartz phyllite
'Dirty quartzites': arkosic to lithic arenites, biotite and/or almandine gneiss, quartz arenite, mica schist
Dolomitic carbonate rock
Greywacke, lithic greywacke, arkosic wacke, subgreywacke (include some 'dirty' quartzites)
Massive to pillowed mafic volcanics

• Data/sample collection point (P.J. Laporte)

URANGESELLSCHAFT CANADA LTD.
Project K-1, Baker Lake

1: OFF 10-11[*]	14: IT 1-591; KF 8-9[o] 78 SCH[o]
2: THE 1-82[*]	15: AJOL 1-8[o]
3: OFF 2-7[*]	16: WUNZ 1-6
4: PIZ 1-236[*]	17: MAN 1-8
5: COO 1-8[o]	18: WAG 1-8
6: LA 1-12[o]	19: LYS 1-8
7: DOVA 1-8	21: PED 1-4
8: SHAY 1-8[o]	22: CAM 1-6
9: LAST 7,8	24: BYA 3-6
10: LAST 2-5; TREE 4	25: UND 1-8[o]
11: TREE 1-2[*]	26: BONG 1-8
12: OTHA 1-8	27: BILA 1-8
13: BAR 1-10	29: BS 5

Lone Gull Deposit

20: L 1-620	23: SSL 1-128

n: F 5-13 - BP MINERALS LTD.

MARLINE MINERAL EXPLORATIONS LTD.
K: V 35-43[*o]; VW 8-14[*o]

[*] partly or totally lapsed in 1984
[o] partly or totally lapsed in 1985

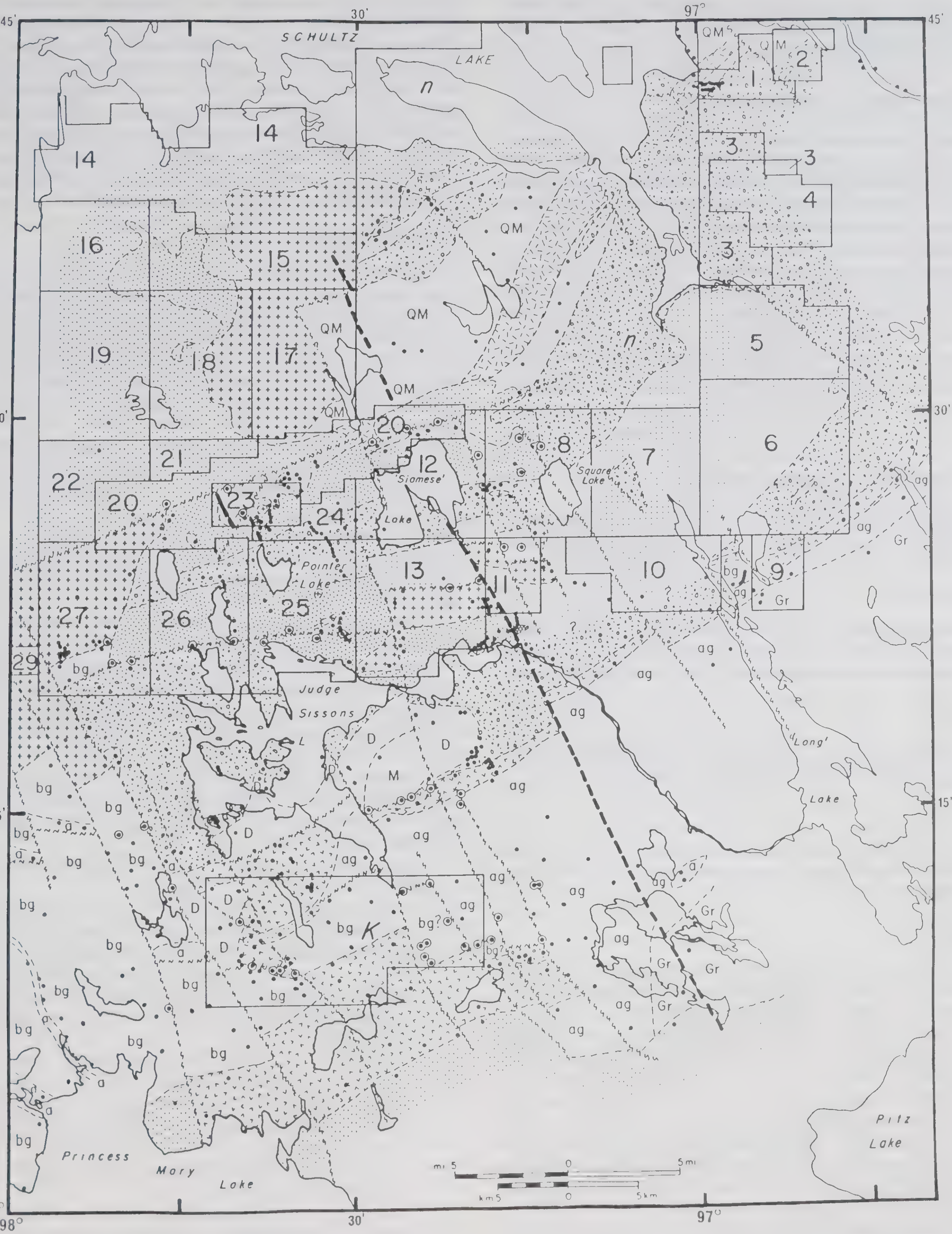


FIGURE 5-11: Geology and properties, Schultz and Judge Sissons Lakes (geology by P.J. Laporte and compiled from assessment reports).

rarely with hematite. In the dirty quartzites, pitchblende is in small blebs along fractures. Reserves are 16,000 t of U_3O_8 in rock grading 0.39% U_3O_8.

CURRENT WORK AND RESULTS

Detailed geophysical and geochemical surveys were used to explore east and west of the Lone Gull grid in 1984 and 1985. Four holes, totalling 370 m, probed the western end of the Main Zone in 1984 and eight holes, totalling 1391 m, tested geophysical anomalies on the Granite grid, 5 km to the west-northwest of the Main Zone. All but two of the eight holes intersected uranium concentrations of interest. The best section contained 0.75% U_3O_8 over 5.8 m at a depth of 100 m (Northern Miner, Nov. 8, 1984).

Drilling resumed in 1985 with 15 holes totalling 3967 m probing the continuity and depth of the Main Zone. Eleven holes totalling 1945 m tested the uranium showing on the Granite grid.

PROJECT K-1, BAKER LAKE

Urangesellschaft Canada Ltd.	Uranium
3100, 2 Bloor St. E	66 A/5-7,10,12; B/8
Toronto, Ont., M4W 1A8	64°30′N, 97°30′W

REFERENCES

Donaldson (1966, 1969); Laporte (1983b, 1984, 1985a); LeCheminant and others (1983); Northern Miner (1984).

DIAND assessment reports: 081374, 081530, 081913, 082055.

PROPERTY

The claims held by Urangesellschaft Canada Ltd. and forming part of this project are listed in Figure 5-11.

LOCATION

Urangesellschaft's Project K-1 area extends north and northeast from Judge Sissons Lake to Schultz Lake and the Thelon River (Fig. 5-11).

HISTORY

Urangesellschaft Canada Ltd. has been exploring the Judge Sissons Lake area since 1974 when an affiliated company, Metallgesellschaft Canada Ltd., acquired Prospecting Permits 317 to 327. Urangesellschaft Canada Ltd. acquired Prospecting Permits 352 and 353 in 1975. SCH 1-136 and SSL 1-128 were staked in 1976 and IT 1-591, L 1-620, PIZ 1-236 and THE 1-82 in 1977. Most of the other claims were acquired in 1978 and KF 1-9 and LAST 1-8 were staked in 1979. Eighty-eight BS, DF, LAST, MOR, OFF, SCH and TREE claims lapsed between 1980 and 1983. One BS, eight OFF and two TREE claims lapsed in 1984, as did all the PIZ and THE claims. The remaining SCH, one AJOL, two COO, one LA, four SHAY and one UND claims lapsed in 1985.

Reconnaissance geochemical surveys, airborne VLF-EM, radiometric and magnetometer surveys, geological mapping and prospecting of the claims in 1978 and 1979 outlined numerous anomalies. Fifty-one grids were established between 1979 and 1983 and explored with geological, geochemical and geophysical surveys (Laporte, 1983b, 1984, 1985a). In 1980, 27 holes totalling 2127 m intersected minor uranium concentrations on three of the grids and barren granite and syenite on a fourth grid (Laporte, 1984). Seven holes totalling 756.6 m were drilled in 1982 and nine holes totalling 1278 m were drilled in 1983. The 1982 holes intersected minor phosphate-related uranium concentrations, while the 1983 holes probed uneconomic concentrations of U_3O_8 in orthoquartzite and the underlying impure quartzites (Laporte, 1985a).

DESCRIPTION

The project involves a study of the western end of a metasedimentary belt trending northeast from Judge Sissons Lake to north of Whitehills Lake (Donaldson, 1966, 1969; LeCheminant and others, 1983). The following description is based on mapping by the author between 1981 and 1983 and by Urangesellschaft geologists in 1980 and 1981. Outcrop in the area is sparse and most of the observations were from areas of angular frost heave.

The oldest rocks in the area are the complex of augen gneiss and quartz diorite to granodiorite extending south and east from Judge Sissons Lake (Fig. 5-11). The augen gneiss consists of large feldspar crystals in a matrix of medium- to fine-grained andesine and fine-grained quartz, mica and hematite. Whether the augen gneiss was derived from the granodiorite during tectonic deformation or is intruded by the plutonic rocks has yet to be determined.

Overlying the augen gneiss northeast of Princess Mary Lake is a sequence of massive, relatively structureless volcanic flows. The rocks are fine- to medium-grained assemblages of chlorite-calcite-epidote aggregates after plagioclase, separated by chlorite, quartz and sphene. The volcanic sequence is repeated through faulting on the south shore of Judge Sissons Lake. Pillowed volcanics also outcrop near the base of the sedimentary package east of "Long" Lake and tephra outcrops near a diorite-monzonite complex contact east of Judge Sissons Lake. The volcanics grade, to the west, into amphibolite and amphibole gneiss.

The volcanics are overlain to the north by a sedimentary package including:

- magnetic iron formation which outcrops in proximity to the volcanics on the east shore of Judge Sissons Lake and northeast of Long Lake. The western outcrops consist of banded magnetite-garnet-quartz rock and amphibole-garnet-biotite rock with minor magnetite. The eastern occurrence consists of banded chert, hematite, and pyrite;
- greywacke ranging in composition from lithic greywackes with 50% fragments to feldspathic greywackes with 5 to 40% feldspars. Carbonate-rich greywackes with up to 40% carbonate are also present in the sequence;
- pelitic rocks including mica and chlorite schists with 45 to 75% phyllosilicates;
- feldspathic to quartzitic arenites and wackes containing 30 to 80% quartz and up to 25% feldspars;
- dolomite and calcareous siltstone which outcrop in restricted areas northeast of Judge Sissons Lake, near Long Lake and along the Thelon River;
- white orthoquartzite which overlies the other sediments

north and northeast of Judge Sissons Lake and south of Schultz Lake.

The sediments grade westward into biotite gneiss which encloses an amphibolite dyke and has been altered, near faults, into augen gneiss.

Urangesellschaft geologists indicate that the lower lithic greywackes north of Judge Sissons Lake grade, through a decrease in size and abundance of lithic clasts, into more quartzose and less feldspathic impure arkosic to subarkosic arenites and wackes. The arenites are interbedded with orthoquartzite and phyllites, which are locally graphitic or garnetiferous. The contact between the main orthoquartzite sequence and the arenite sequence is apparently conformable but poorly exposed.

The supracrustals are intruded by igneous bodies of different ages. The oldest two intrusions outcrop south and east of Judge Sissons Lake and south of Schultz Lake. These bodies intrude the volcanics and lowermost part of the sedimentary package but are not found in contact with the orthoquartzite. The body near Judge Sissons Lake consists of monzonite to the southeast and diorite to the west. The body near Schultz Lake was mapped as quartz monzonite by B.P. Minerals Ltd. geologists. The relationship between these two bodies, if any, is unknown.

The younger intrusions are a complex mixture of fluorite-bearing biotite granite and syenite outcropping as a large body along the northwestern edge of the area, as a smaller pluton northeast of Judge Sissons Lake and in small stocks in the vicinity of the Lone Gull Deposit.

The youngest supracrustals in the map area belong to the Dubawnt Group. They include quartz-hematite breccia or regolith and Thelon Formation sandstone and conglomerate. Rocks mapped as regolith range from angular quartz clasts in a fine-grained quartz, clay and hematite matrix to massive quartz-clay-hematite rock. These rocks are cut by numerous quartz veins and quartz-specularite veins and are preserved in fault zones, especially the east-trending faults, and in one area southeast of Judge Sissons Lake. In two outcrops south of Judge Sissons Lake, regolith is associated with dykes of Pitz Formation quartz porphyry.

Thelon Formation sandstone and conglomerate outcrop on the north shore and east of Princess Mary Lake, in two restricted areas southwest of Judge Sissons Lake and in a belt north of "Pointer" Lake. These rocks are less indurated than the other sediments in the area.

Because of the paucity of outcrop, very few bedding plane orientations could be determined. The orthoquartzite south of Schultz Lake trends north-northeast and dips shallowly to steeply west. Rocks north of Pointer Lake trend east and dip shallowly north. Rocks east of Pointer Lake trend north-northeast and dip west, while further east they trend east and dip shallowly to steeply south. The rocks near Judge Sissons Lake trend east and dip shallowly south, except on the main island, where the dip is steeply south, and to the east where a steep northerly dip was recorded. The volcanics south of Judge Sissons Lake dip north. Layering in the gneisses and gneissic intrusions parallels the contact with the supracrustals except in the vicinity of faults. The distribution of lithologies and structural data indicate that the rocks north of Judge Sissons Lake are part of an east- to northeast-trending anticline.

Three generations of major faults cross-cut the area. The oldest is the east-trending thrust or reverse fault causing the repetition of the stratigraphy south of Judge Sissons Lake. A second generation, possibly related to the thrust fault, is the east-trending faults at the south end and north of Judge Sissons Lake. Aeromagnetic and outcrop patterns indicate an apparent right lateral displacement of 15 km along the fault north of Pointer Lake. Most of the regolith is along these east-trending faults. The northeast- trending fault near the Lone Gull Deposit is possibly part of a conjugate set with the east-trending faults. The youngest faults trend north-northwest and served as the locus for intrusion of the Mackenzie diabase dykes. Apparent displacement along these faults range from 3 km right lateral to 10 km left lateral. True displacement was probably vertical.

CURRENT WORK AND RESULTS

Detailed geophysical surveys including gravity, VLF-EM and MaxMin and geochemical surveys were done in 1984 on grids west and north of Pointer Lake, northwest of "Square" Lake and north of Long Lake. The orthoquartzite-arenite contact north of Long Lake was prospected, as was the area northeast of Judge Sissons Lake. Six holes totalling 1067 m were drilled on the Bong grid, previously Roughland and Area 8 grids (Laporte, 1985a), 5 km west of Pointer Lake. The holes intersected discontinuous uranium concentrations in a 12 m wide zone. The best assay was 0.6% U_3O_8 over 6.1 m at a depth of 140 m (Northern Miner, Nov. 8, 1984).

On the PL 23 grid, north of the Lone Gull Deposit, 40 reverse circulation holes totalling 1176.6 m probed radon anomalies. Twenty-five of the holes penetrated 2 to 52 m into bedrock. Geophysical and geochemical surveys were also completed on this and other nearby grids.

Further geophysical, geochemical and geological surveys were undertaken in 1985. The area west of the Bong grid was explored. Nineteen holes totalling 4476.9 m tested the showing discovered on the Bong grid in 1984 and four holes totalling 521.5 m were drilled on anomalies on the Caribou grid 6 km to the southeast. Three holes totalling 420.0 m tested anomalies on the RD 3/4 grid north of Long Lake. In the northwestern part of the claim group, 14 holes totalling 2117.8 m tested two anomalies on WAG 1, 2, 4 and 5.

WHITEHILLS LAKE PROJECT

Comaplex Resources Intern'l Ltd.	Gold
901, 1015 Fourth St. SW	66 A/9
Calgary, Alta., T2R 1J4	65º42'N, 96º15'W

REFERENCES

Laporte (1974a, 1984, 1985b); Taylor (1986).
DIAND assessment report: 081938.

PROPERTY

Prospecting Permit 1078, MCLEOD and OLIVIA.

LOCATION

The prospecting permit and OLIVIA are north of the western half of Whitehills Lake. MCLEOD is west of Whitehills Lake and 3 km east of the Thelon River (Fig. 5-9).

HISTORY

The area west of Whitehills was held as Prospecting Permit 93 by Ensign Oil Ltd. and Fort Reliance Minerals Ltd. from 1969 to 1972. Airborne and ground geophysical surveys and geological surveys done in 1969 and 1979 outlined 29 conductors, nine of which were considered to be of interest (Laporte, 1974a).

The northern part of the area was held as Prospecting Permits 753 and 754 by Hudson's Bay Oil and Gas Company Ltd. between 1981 and 1983. Geological mapping, prospecting, ground and airborne geophysical surveys were done over the volcanic belt north of Whitehills Lake (Laporte, 1984).

Comaplex Resources International Ltd. acquired Prospecting Permit 1078 in 1985. The OLIVIA and MCLEOD claims were added to the property in September and December.

DESCRIPTION

An east-northeast trending sequence of greywackes underlies the northern part of the properties. It is overlain to the south by a zone of varied lithology consisting of iron formation, slate, dolomite, argillite, siltstone and phyllite intruded by small plutons of gabbro, peridotite and serpentinite. Mafic volcanic rocks, enclosing komatiites near the base, and thin layers of greywacke, iron formation and felsic volcanic rocks overlie the zone of varied lithology. A prominent white orthoquartzite is interlayered with and locally thrust onto the volcanic sequence along the north shore of Whitehills Lake. West and northwest of Whitehills Lake, the volcanic rocks at or near their contact with the orthoquartzite are intruded by gneissic to massive granodiorite (Taylor, 1986).

Most of the geophysical anomalies detected in 1969 and 1970 are associated with a major band of iron formation outcropping discontinuously at the top of the greywacke sequence from the Thelon River to east of Whitehills Lake. Other anomalies correspond to shear zones in the volcanics (Laporte, 1974a). Hudson's Bay Oil and Gas Company Ltd. geologists reported that a quartz-carbonate vein north of Whitehills Lake contained 520 ppb Au (Laporte, 1984).

During an investigation of the gold potential of the area by the author, samples were collected from iron formation (17 samples), carbonate-bearing shear zones (3 samples) and quartz veins (11 samples) in the Whitehills Lake area. Two of the samples of iron formation contained 514 ppb Au and 38 ppb Au. Samples of the carbonate zones contained up to 38 ppb Au and those of quartz veins contained up to 171 ppb Au (Laporte, 1985b).

CURRENT WORK AND RESULTS

Prospecting of the Whitehills Lake area in 1985 resulted in the discovery of a quartz vein, containing up to 11.9 ppm Au, at the granodiorite-volcanic contact along the west edge of the permit area. At the north end of the vein, fractures in the quartz are coated with stibnite, a sample of which contained 125 ppm Au. Smaller quartz veins and disseminated chalcopyrite, in the basalts north of the vein, contain up to 3.3 ppm Au and 178 ppm Ag.

MARJ CLAIMS

PNC Exploration (Canada) Co. Ltd.	Uranium
2401, 650 West Georgia St.	66 B/3, 5,6
Box 11571, Vancouver Centre	64°25'N, 99°23'W
Vancouver, B.C., V6B 4N8	

REFERENCES

Laporte (1978, 1979, 1983a,b, 1984, 1985a); LeCheminant and others (1983, 1984).

DIAND assessment reports: 081842, 081845.

PROPERTY

MARJ 1-16.

LOCATION

The claims are north of Marjorie Lake and south of Aberdeen Lake (Fig. 5- 12).

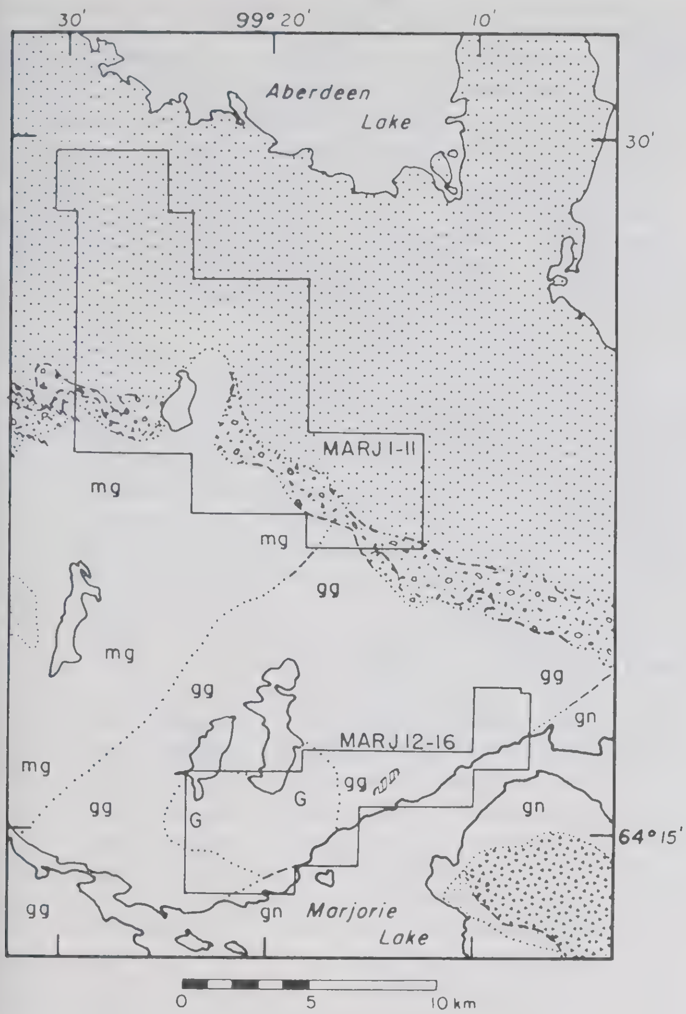
HISTORY

MARJ 1-11 were staked in 1983 and MARJ 12-16 in 1984. The claims cover ground held by Urangesellschaft Canada Ltd. as Prospecting Permit 354 and the BA and MAJ claims between 1975 and 1982. Exploration of the Marjorie-Aberdeen Project between 1975 and 1982 included airborne and ground geophysical surveys, geochemical surveys and geological mapping. Fracture-related uranium concentrations on the AB claims, southeast of the MARJ claims, were drilled in 1982 with discouraging results (Laporte, 1978, 1979, 1983a,b, 1984). The MARJ 1-11 claims and adjacent areas were explored in 1983 with mapping, prospecting and lake sediment sampling. A grid was constructed along the unconformity on the claims and explored with detailed geological mapping, boulder prospecting, magnetic, EM-16 and radiometric surveys and overburden sampling (Laporte, 1985a). MARJ 1 and 2 lapsed in 1985.

DESCRIPTION

Archean or early Proterozoic granite, gneissic granite and granitic augen gneiss underlie the southern part of MARJ 1-11. This granitic complex is overlain to the north and west by acid volcanics and subvolcanic intrusions, arkose and conglomerate of the Pitz and Kunwak Formations. Sandstone of the Thelon Formation overlies these rocks in the northern half of the claims.

MARJ 12-16 cover part of a northeast-trending, complex tectonic zone 8 to 10 km wide. The heterogeneous mixture of retrograded gneisses, gneissic granite, fine-grained mylonitic augen gneisses and chlorite schist of this zone enclose a less than 100 m wide tectonic sliver of Aphebian orthoquartzite north of Marjorie Lake. In the western part of the claim group, the gneisses are intruded by massive to weakly foliated, fluorite-bearing biotite granite (LeCheminant and others, 1983, 1984).



HELIKIAN and LATE APHEBIAN
DUBAWNT GROUP

Thelon Fm: Quartz arenite, minor mudstone and conglomerate

: Ortho- and paraconglomerates with clasts of porphyritic volcanic rocks, minor lithic sandstone and mudstone

Pitz Fm: Quartz- and feldspar-phyric lavas and welded tuffs

: Quartz arenite (aeolian?), minor conglomerate

APHEBIAN

G Biotite granite; massive to weakly-foliated, fluorite-bearing

Quartzite, minor mica schist

APHEBIAN/ARCHEAN

gg Cataclastic granitoid gneisses, gneissic granite, minor chloritic metasediments

mg Megacrystic gneissic granite and augen granite gneiss

gn Layered to weakly foliated granitic and granodiorite gneisses and migmatite; minor augen gneiss, biotite-garnet paragneiss and amphibolite

FIGURE 5-12: Geology of the MARJ claims (geology from LeCheminant and others, 1983).

CURRENT WORK AND RESULTS

A 1500 line km helicopter-borne radiometric survey of the area north and east of Marjorie Lake outlined 466 anomalies in 1984. Subsequent reconnaissance geological mapping and prospecting of 433 of the anomalies led to the discovery of 22 anomalous concentrations of uranium, most of which were associated with phosphatic enrichment in Thelon Formation sandstone and the underlying regolith. Lithogeochemical studies were performed on the basal Thelon Formation rocks.

Two grids were established. Grid B, totalling 63.6 line km, on the north shore of Marjorie Lake was explored with geological mapping, prospecting and 58.6 line km of magnetic, gradiometric and VLF-EM surveys. The grid covers a metasedimentary sequence striking northeast, dipping steeply northwest and intruded by biotite granite to the north. The geophysical surveys delineated northwest-trending faults in the area but no uranium concentrations were detected.

Grid C, to the east, totals 22.6 line km and was explored with mapping, prospecting and radiometric, VLF-EM and Track Etch surveys. It covers two areas of uranium-bearing boulders of brecciated Pitz Formation volcanics and older metasediments. The breccia fragments are cemented by apatite-hematite veins and patches.

PROJECT DUBAWNT

Westmin Resources Ltd. — Uranium
25 Adelaide St. E — 66 B,C,G,H
Toronto, Ont., M5C 1Y2

REFERENCES

Laporte (1979, 1981, 1983a,b, 1984, 1985a); LeCheminant and others (1984); Tella (1984); Tella and others (1983, 1984).

DIAND assessment reports: 081778, 081856.

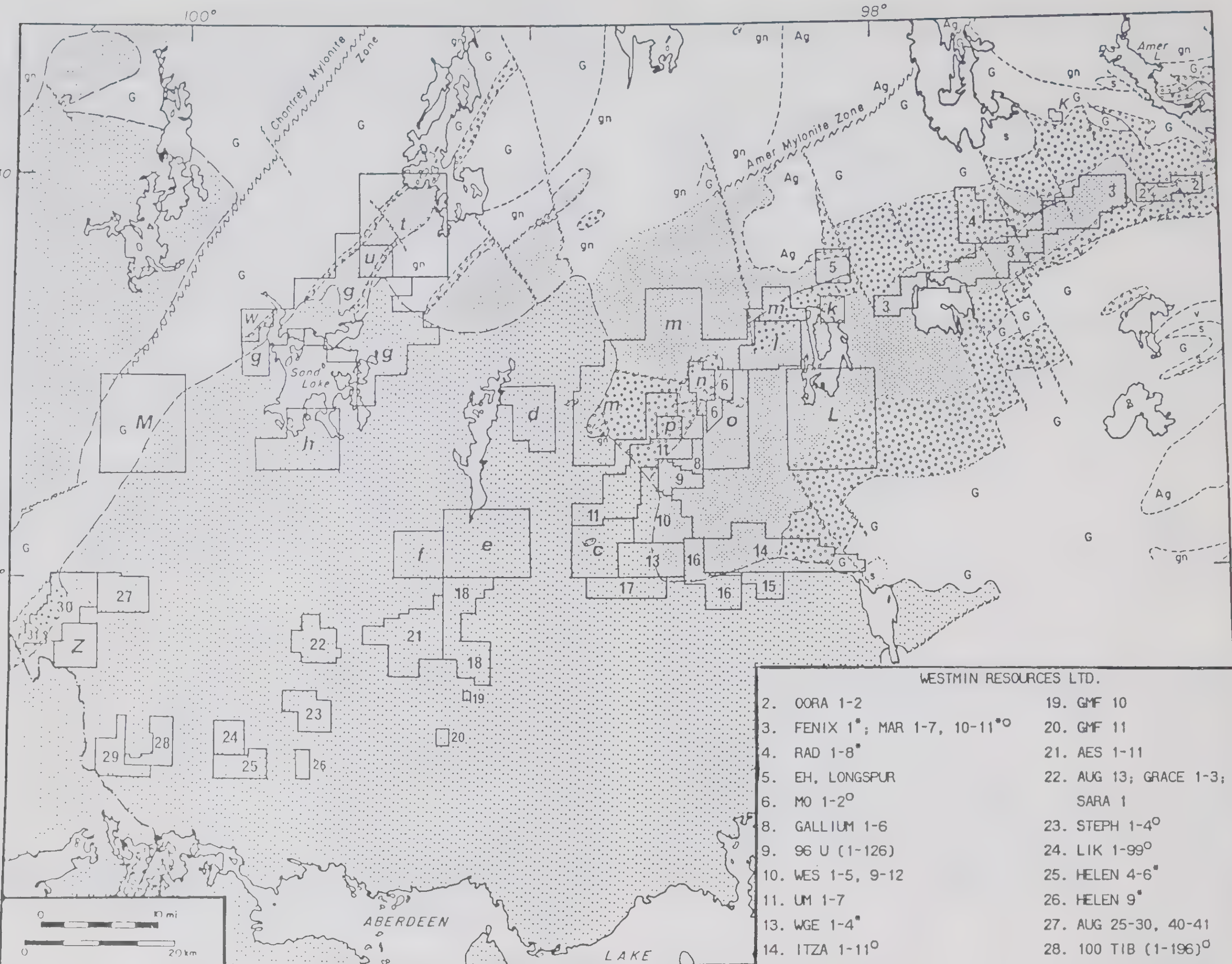
PROPERTY

The properties explored are listed in Fig. 5-13.

HISTORY

Westmin Resources Ltd. and its precursors have been exploring the project area since 1976 when Prospecting Permits 425 and 427 and U 1-159 were acquired. Prospecting Permit 466 and AZW 1-30, CAN 1-178, 97 CHE, LIK 1-99, NOR 1-165 and TIB 1-196 were acquired in 1977. Prospecting Permits 468, 469, 537 to 542, UM 1-8 and WGE 1-4 were acquired in 1978. EH, GALLIUM 1-6, GC 1-2, GSE 1-2, LA 1, LAPLAND, LONGSPUR, TERN and WES 1-12 were added in 1979 and another 95 claims in 1980. Prospecting Permits 425 to 427 and 466 expired in 1980, Prospecting Permits 468 and 469 in 1981 and Prospecting Permits 537 to 542 in early 1982. In 1980 and 1981, 126 claims were allowed to lapse. More claims lapsed in 1982 and 1983. AUG 13 and RHM 2 were staked in 1984. GALLIUM 6, GMF 7 and 9, GRACE 1 and 3, LONGSPUR 1, RAD 2 and 3, SARA 1, UM 1 and 6 and WEST 4 and 12 had their areas reduced in 1984.

Geological and geochemical surveys done in 1976 and 1977 led to the discovery of a number of uranium concentrations in Amer Group sediments, one of which was probed with seven



HELIKIAN
DUBAWNT GROUP
Thelon Fm: sandstone, pebbly sandstone, conglomerate

HELIKIAN or LATE APHEBIAN
Ag: Granite, quartz monzonite, syenite; fluorite-bearing

APHEBIAN
AMER GROUP
Upper units: Feldspathic sandstone, interbedded mudstone, calcareous sandstone, graphitic slate, arkose
Gabbro
Mudstone, siltstone, minor quartz wacke; mafic volcanic rocks and chlorite schist, slate, phyllite
Dolomitic limestone, intercalated chert, talc-tremolite-schist, wacke
Feldspathic quartzite
Impure clastic rocks: lithic arenite, quartz-muscovite-, quartz-biotite-, quartz-graphite-schists, iron-rich mudstone, siltstone
Lower units: Orthoquartzite, quartz-mica schist, minor pebbly quartzite and conglomerate
Phyllite, muscovite schist and feldspathic sandstone, polymictic pebble to cobble conglomerate

ARCHEAN and/or APHEBIAN
G: Granite, granodiorite, gneissic granitoid rocks and granitic augen gneiss
s: Greywacke, chlorite schist, iron formation, biotite schist, paragneiss
v: Metavolcanic and ultramafic rocks, minor sills and dykes
gn: Layered and migmatitic granitoid gneisses, granulite, paragneiss, minor augen gneiss.

WESTMIN RESOURCES LTD.

2. OORA 1-2	19. GMF 10
3. FENIX 1*; MAR 1-7, 10-11*°	20. GMF 11
4. RAD 1-8*	21. AES 1-11
5. EH, LONGSPUR	22. AUG 13; GRACE 1-3; SARA 1
6. MO 1-2°	23. STEPH 1-4°
8. GALLIUM 1-6	24. LIK 1-99°
9. 96 U (1-126)	25. HELEN 4-6*
10. WES 1-5, 9-12	26. HELEN 9*
11. UM 1-7	27. AUG 25-30, 40-41
13. WGE 1-4*	28. 100 TIB (1-196)°
14. ITZA 1-11°	29. AUG 14-16, 38-39
15. RHM 2; RN 1-2°	30. UP 16-21*°
16. CAN 1-178	31. GEN 1; KK 1; PRJN 1; RHM 1
17. EXT 3-5*°	
18. GMF 1-9	

CANADIAN NICKEL COMPANY LTD.

c. TM 2-7*°	e. TM 24-35*°
d. TM 15-18, 22*°	f. JM 2-5

MOBIL ENERGY MINERALS LTD.

g. 26 SAN (47-96)*°	h. SAN 28-32, 87-89*°

URANGESELLSCHAFT CANADA LTD.

k. JVK 1	n. DIANA 1-5
l. IRMA 1-3; SH 1-130	o. DIANA 6; KB 1-8
m. 34 SAN (1-43)*°	p. SHW 1-64*

UNION OIL COMPANY OF CANADA LTD.

t. Prosp. Perm. 782*	u. SAND 1-2

URANERZ EXPLORATION AND MINING LTD.

L. Prosp. Perm. 758*	M. Prosp. Perm. 757*

HUDSON'S BAY OIL AND GAS LTD.

W. DRUM 1-3*°	Z. TIB 1-4, 7

* partly or totally lapsed in 1984
° partly or totally lapsed in 1985

FIGURE 5-13: Geology and properties north of Aberdeen Lake (geology from Donaldson, 1966; LeCheminant and others, 1984; Tella, 1984).

Winkie drill holes (Laporte, 1978, 1981). Geochemical, airborne geophysical and geological work further to the southwest in 1978 and 1979 outlined 14 areas of anomalies requiring follow-up surveys (Laporte, 1983a,b). Seven of these areas were explored with ground surveys in 1980 and 13 holes totalling 1855 m were drilled to obtain stratigraphic information about the Thelon Formation. Detailed airborne geophysical surveys and geochemical surveys were done in 1981 (Laporte, 1984). Seven areas of interest outlined during these surveys were explored with detailed geological, geophysical and geochemical surveys in 1982 (Laporte, 1985a).

DESCRIPTION

A 20 to 30 km wide belt of Aphebian Amer Group orthoquartzite, shale, siltstone, feldspathic sandstone and dolomitic limestone trends southwest in the eastern part of the project area. The sedimentary rocks are flanked by granitic gneisses to the northwest and southeast and are overlain to the southwest by sandstone and pebbly sandstone of the Helikian Thelon Formation (LeCheminant and others, 1984; Tella, 1984; Tella and others, 1983, 1984).

Three types of uranium occurrences have been detected: unconformity vein-type; Aphebian (syngenetic); and sandstone-hosted (phosphatic). The unconformity vein-type showings are narrow stockwork fractures with chlorite, calcite, hematite, kaolinite and quartz in feldspathic quartzite of the Amer Group. Samples of boulders from the RAD claims contain up to 1.6% U_3O_8, but average 0.1% U_3O_8. Samples from other unconformity-type boulder trains on the EH/LONGSPUR and UM claim blocks contained up to 4.5 and 13.3% U_3O_8. The syngenetic showings are pelite-hosted nodular concentrations and pore fillings of pitchblende, chalcopyrite, pyrite, magnetite and calcite in sandy interlayers and siltstone of the Amer Group. Grab samples contain up to 2.71% U_3O_8, but these showings generally contain 0.05% U_3O_8 over 2 to 2.5 m widths. The sandstone-hosted deposits contain up to 0.1% U_3O_8, generally associated with various amounts of phosphate. Some showings occur in strongly brecciated zones.

CURRENT WORK AND RESULTS

Two grids, in Area 2 (ITZA, RHM and RN claims) and Area 7 (AUG, GRACE and SARA claims), were each extended 16 line km in 1984. The geomorphology of these grids was mapped and they were explored with VLF-EM and radon-in-soil surveys. The grid on Area 2 was also prospected and surveyed with scintillometers. Anomalous radon concentrations were detected in both areas associated with the head of the trains of uranium-bearing boulders. Perimeter surveys of nine claim blocks were also completed in 1984.

UP CLAIMS

Westmin Resources Ltd.	Uranium
25 Adelaide St. E	66 C/16; F/1
Toronto, Ont., M5C 1Y2	65°00′N, 100°15′W

REFERENCES

Laporte (1984, 1985a); LeCheminant and others (1984); Tella (1984); Tella and others (1984).

DIAND assessment report: 081597.

PROPERTY

GEN 1, KK 1, PRJN 1, RHM 1, and UP 16-21.

LOCATION

The claims are north of Beverly Lake (Fig. 5-13).

HISTORY

UP 1-22 were staked in June, 1980 for Seru Nucleaire (Canada) Ltee. who explored the property with INPUT and helicopter-borne radiometric surveys, geochemical lake water and sediment and soil surveys, mapping and prospecting. In 1981, a grid established on an INPUT conductor was tested with prospecting, a detailed geochemical lake water and sediment survey, mapping, magnetometer, resistivity, VLF-EM and gravity surveys, radon-in-soil and frost boil geochemical surveys (Laporte, 1984). UP 16-21 were transferred to Westmin Resources Ltd. and UP 1-15 and 22 were allowed to lapse in 1982.

In 1982, a Westmin Resources Ltd. crew established grid lines intermediate to the existing lines and surveyed them with MaxMin and VLF-EM. Geological mapping and a 833-site radon-in-soil survey were also done (Laporte, 1985a). GEN 1, KK 1, PRJN 1 and RHM 1 were added to the property in 1984 and UP 21 was reduced in area. UP 16 lapsed in 1984 and UP 18 lapsed in 1985.

DESCRIPTION

The north shore of Beverly Lake is underlain by Helikian Thelon Formation sandstone. The unconformity between the sandstone and the granitic basement complex trends northeast from north of Beverly Lake across the property to northwest of Sand Lake. A belt of Amer Group sediments outcrops at the unconformity on the claims (LeCheminant and others, 1984; Tella, 1984; Tella and others, 1984).

CURRENT WORK AND RESULTS

The original grid was extended to the southwest and the additional 25 line km were explored with radiometric and VLF-EM surveys and a 923-site radon-in-soil survey. Boulder prospecting and geomorphological mapping were also done. Anomalous radon gas concentrations of up to 12 times background were detected, as were a number of well-defined conductors thought to correspond to graphitic layers in the Amer Group metasediments. A perimeter survey of the new and reduced claims was completed.

DEEP ROSE PROJECT

Urangesellschaft Canada Ltd.	Uranium
3100, 2 Bloor St. E	66 G/2,7,8
Toronto, Ont., M4W 1A8	65º12'N, 98º55'W

REFERENCES

Laporte (1983b, 1985a); Taylor (1978); Tella(1984).
DIAND assessment reports: 081806, 081807, 081848.

PROPERTY

The properties explored are listed in Figure 5-13.

LOCATION

The project covers the area east of Sand Lake (Fig. 5-13).

HISTORY

Urangesellschaft Canada Ltd. began exploring the area in 1974. Lake sediment and water geochemical surveys, airborne radiometric and magnetic surveys, mapping and prospecting led to the discovery of numerous uranium-bearing boulder trains. Grids established on the claims were explored, from 1978 to 1983, with one or more of the following surveys: soil sampling, radiometric, magnetic, VLF-EM and HLEM, IP and gravity surveys, prospecting, mapping, Alpha Nuclear and Track Etch radon measurements and soil geochemical surveys. Eight holes totalling 924.8 m were drilled to locate the source of the boulders on the SH claims in 1979 (Laporte, 1983b).

DESCRIPTION

The properties cover the unconformable contact between southwest-trending Aphebian Amer Group metasediments and the overlying Helikian Thelon Formation sandstone and conglomerate. The Amer Group rocks include orthoquartzite and quartz-mica schist overlain by feldspathic sandstone with interbedded mudstone, calcareous sandstone, siltstone, graphitic slate and arkose. These rocks are deformed into a series of upright to overturned synclines and anticlines and enclose gabbro sills which outcrop in the southeastern part of the claims (Tella, 1984).

Taylor (1978) recognized four rock types in the area of the uranium showing on the SH claims:

- thin siltstone and mudstone beds interbedded with thin, crenulated hematitic arkosic arenites;
- fine-grained, pink hematitic arkosic arenite with a few thin light green to brown mudstone interbeds;
- dolomitic sandstone with a few pink arkosic sandstone interbeds; and
- grey to black siltstone with a few grey mudstone interbeds and irregular lenses of purple, hematitic, arkosic sandstone containing disseminated magnetite and pyrite.

Uraninite, the major uranium-bearing mineral, occurs as disseminations in the matrix of the interbedded siltstone-arkose layers and also near or within magnetite-ilmenite grains. Where the clasts are relatively far apart and porosity was sufficient, uraninite is in layers paralleling the outline of the pore or veinlet. Some pitchblende is present as large aggregate massive blebs with random shapes in areas of high uraninite concentration.

Taylor (1978) attributes the deposition of the uraninite to a low-temperature hydrothermal replacement event associated with regional metamorphism. The pitchblende was deposited during local remobilization of the uranium. The 1979 drilling was done along two sections 400 m apart and the best intersection was 0.2% U_3O_8 over 0.3 m. Estimated ore reserves on the grid are 900,000 t grading 0.104% U_3O_8.

In 1982 and 1983, exploration concentrated on defining and tracing newly discovered trains of radioactive feldspathic quartzite boulders and one train of pitchblende nuggets and dolomite boulders containing pitchblende, hematite, sulphides and arsenides (Laporte, 1985a).

CURRENT WORK AND RESULTS

Geological mapping and prospecting, at 1:25,000, of the eastern half of the property in 1984 confirmed that the Amer Group rocks in the area consist of three units. The lowermost unit is a sequence of thick-bedded white orthoquartzite with minor sericitic quartzite and quartz-sericite schist. It is separated from an upper sequence of feldspathic quartzite and siltstone with interbedded mudstone by a poorly exposed transitional unit including dolomite and slate. The upper unit is strongly folded and outcrops in a northeasterly to easterly trending synclinorium in fault contact to the southeast with an antiform of orthoquartzite. Syngenetic to early diagenetic uranium concentrations are fairly common in the feldspathic quartzite and siltstone sequence, but uneconomic. The boulders in the newly discovered trains contain several per cent uranium and were derived from areas where the original stratabound mineralization was remobilized into fractures during diagenesis and metamorphism.

A 74.6 line km grid was established on the Lost Lake Showing (SH claims), which was drilled in 1979,and explored with VLF-EM and magnetic surveys, geological and glacial deposits mapping, prospecting and an 801-sample soil survey. Anomalous uranium and copper concentrations in soil were detected in an area of intense cross-faulting of magnetic siltstone layers at the head of the radioactive boulder trains. The 1979 drilling fences parallel these cross-faults.

On the EX grid (SAN 18,25), the area of the train of pitchblende nuggets, 56.5 line km of gridding, VLF-EM, magnetic, gradiometric and HLEM surveys were completed over water-covered sections of the main grid and extensions to the east and south. The surveys detected a complex series of magnetometer and VLF- EM anomalies at the head of the trains. These anomalies are attributed to a thrust fault locally containing secondary iron minerals and graphite.

A feldspathic quartzite boulder train was covered by the 76.3 line km RB Hill grid (DIANA 5, KB 5, SAN 45). VLF-EM, magnetic, gradiometric,radiometric, HLEM and resistivity surveys, geological and glacial deposit mapping, prospecting and a radon-in-soil survey, using the Powell tube method, indicate that the boulders are from sandstone lenses of limited extent in the feldspathic sandstone/siltstone assemblage.

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CHAPTER 6
SOUTHEAST MACKENZIE DISTRICT

Walter A. Gibbins
District Geologist, Arctic Islands

INTRODUCTION

In 1984-85, the Arctic Islands District Geologist continued to monitor mineral exploration in the southeastern District of Mackenzie. This area includes Paleozoic carbonates of the Great Slave Plain, where lead-zinc is the main exploration target, and part of the Churchill Province of the Precambrian Shield, where uranium has been the principal commodity sought. Relative to 1980-81 and 1982-83 (Gibbins, 1984, 1985), the 1984-85 field seasons saw a further decrease in uranium exploration in the Western Thelon Plain, the East Arm and Nonacho Lake areas. Lead-zinc exploration in the Great Slave Plain was also reduced as exploration was focused mainly in areas of previously discovered deposits. In contrast, there was increased exploration level for base and precious metal deposits in the Churchill Province and a continued strong exploration effort at Highwood Resources Ltd.'s niobium-tantalum-beryllium-rare earth deposits in the Blatchford Lake Complex.

THE WESTERN THELON PLAIN

The Western Thelon Plain includes most of the Thelon River drainage basin within the eastern District of Mackenzie and corresponds to the southwestern half of the Thelon Basin (Fig. 6-1). The northern part of this area lies within the Thelon Game Sanctuary, where mineral exploration is not permitted. The southern part, which is extensively covered by glacial deposits (Craig, 1964) has been intermittently explored for uranium since 1969 (Laporte, 1974a,b, 1979, 1981; Gibbins, 1983a,b, 1984, 1985).

The Dubawnt Basin is a large, structural-sedimentary basin defined by the various units of the Helikian (Middle Proterozoic) Dubawnt Group, (Curtis and Miller. (1979), Miller and others, (1985) and Miller and Le Cheminant (1985). In the Western Thelon Plain, the lower and middle units of the Dubawnt Group are absent, and the Thelon Basin is characterized by sparse flat-lying outcrops of the Thelon Formation, the upper unit of

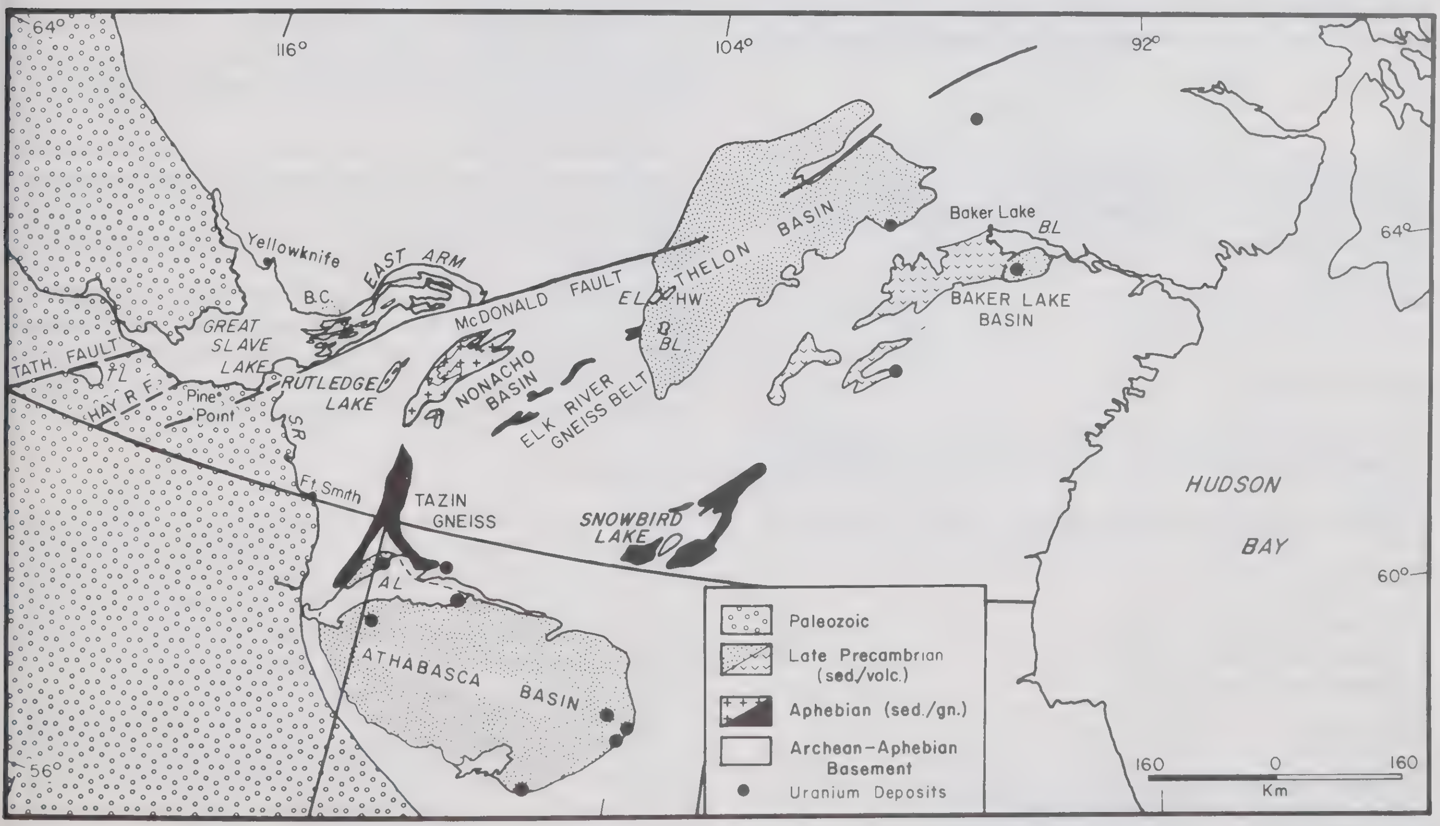

FIGURE 6-1: Map of the Southeast Mackenzie District, Dubawnt and Athabasca Basins. BL - Beaverhill Lake, EL - Eyeberry Lake, AL - Lake Athabasca, BC - Blatchford Complex, HW - Hurwitz quartzite, SR - Slave River.

the Dubawnt Group. It consists mainly of sandstone (quartz arenite and ortho-quartzite) and includes a basal conglomerate associated with pebbly sandstone and volcanic-rich lithic sandstone (Donaldson, 1965, 1969). A well-developed regolith is generally present at the contact between the Thelon Formation and underlying Aphebian-Archean basement (Table 6-1). Small outliers of Thelon Formation are common near the margin of the Thelon Basin. An inlier of white quartzite that has tentatively been correlated with the Aphebian (Lower Proterozoic) Hurwitz Group (Table 6-1) forms a prominent ridge northeast of Eyeberry Lake (HW in Fig. 6-1; Wright, 1967; Eade 1981).

The Thelon Formation is similar to, and possibly correlative with, the Athabasca Formation of northern Saskatchewan. The Athabasca Basin has been the focus of intensive uranium exploration for several years, and numerous uranium deposits and showings have been found.

The basement rocks are intrusive granites and granodiorites separated by belts of metasedimentary and metavolcanic gneisses of Lower Proterozoic age (1.6 to 1.8 Ga B.P.). The latter are considered favourable targets for unconformity-related uranium deposits of the Key Lake-Rabbit Lake type (Dahlkamp, 1978).

By 1984-85 only one company, PNC Exploration (Canada) Co. Ltd., was active in the Thelon Basin. They had two projects in the southwestern Thelon Basin, one near Eyeberry Lake and "Dunkel Lake" (Fig. 6-2); the other in the eastern Thelon Basin at Marjorie Lake, in the district of Keewatin (see Chapter 5).

TABLE 6-1: FORMATIONS - WESTERN THELON PLAIN

Diabase and related dike rocks	
DUBAWNT GROUP:	dolostone; silicious dolostone; basalt
Thelon Formation:	sandstone; pebbly sandstone, conglomerate; minor siltstone, mudstone unconformity (regolith) unconformity (regolith)
HURWITZ GROUP:	quartzite; minor siltstone
Aphebian Basement:	ultramafics; mafic, intermediate and felsic gneiss; pelitic and calcareous gneiss; intrusive rocks (granite, granodiorite, undifferentiated granitoid gneiss and Muskeg Lake Granite)
Archean Basement:	gabbro, diorite, quartz diorite, granodiorite, granite

EYEBERRY LAKE PROJECT PROSPECTING PERMITS 1022, 1071, 1072

PNC Exploration (Canada) Co. Ltd.	Uranium
Box 11571	75 I/15; P/1,2
2401-650 W Georgia St.	63°15'N, 104°30'W
Vancouver, B.C., V6B 4N8	

REFERENCES

Craig (1964); Donaldson (1969); Gibbins (1984, 1985); Taiga Consultants Ltd. (1980); Laporte (1981); Miller (1983); Wright (1967).

DIAND assessment reports: 081399, 081824, 081958.

PROPERTY

Prospecting Permit 1022	75 P/2 SE
Prospecting Permit 1071	75 P/1 SW
Prospecting Permit 1072	75 I/15 NE

LOCATION

The permits are south and east of Eyeberry Lake (Fig. 6-2). Eyeberry Lake is 120 km west of Dubawnt Lake and 500 km east-northeast of Yellowknife.

HISTORY

Prospecting Permit 1022 was granted to PNC Exploration (Canada) Co. Ltd. in February, 1984. Prospecting Permits 1071 and 1072 were granted in 1985. The mineral rights to Permit area 1022 (75 P/2 SE) were previously held by Union Oil Co. of Canada Ltd. as Prospecting Permit 665 from 1980 to 1983 (Gibbins, 1984, p. 224), by Urangesellschaft Canada Ltd. as Prospecting Permit 383 from 1976 to 1979 (Laporte, 1981), and by Canadian Gridoil Ltd. as Prospecting Permit 97 during 1969-70.

Prospecting Permit 1071 (75 P/1 SW) was previously held by Urangesellschaft Canada Ltd. as Prospecting Permit 636 (1979-81). NTS area 75 I/15 NE (Prospecting Permit 1072) was previously covered by Prospecting Permit 382 by Urangesellschaft Canada Ltd. from 1974 to 1978 and Prospecting Permit 91 by Esperanza Oil Co. Ltd. (1969-70).

From 1979 to 1980, Gulf Minerals Canada Ltd. explored the area immediately north of Prospecting Permit 1071 (NTS 75 P/1 NW, P/8 SW).

Gulf Minerals Canada Ltd. did heliborne VLF-EM, HLEM, radiometric and magnetic surveys, resistivity, spectrometry and Track Etch surveys, lake sediment, lake water, soil and till sampling, prospecting, mapping and diamond drilling (Gibbins, 1983, 1984).

Gulf Minerals Canada Ltd. intersected 400 m of Thelon Formation sandstone and 400 m of serpentinized, iron sulphide- and magnetite-bearing ultramafic rocks in one hole (JP-4) centred on pronounced and coincident gravity and magnetic anomalies (DIAND assessment report 081399).

DESCRIPTION

The permit areas are underlain by Thelon Formation sandstone resting unconformably on basement granites and paragneiss (Wright, 1967; Donaldson, 1969; Taiga Consultants Ltd., 1980). This unconformity is the prime target of most of the uranium exploration in the region. The Thelon Formation consists of clay-rich, medium- to very coarse-grained orthoquartzite, that may contain beds of radioactive, red, phosphatic sandstone. Small amounts of uranium may be present with the hematite-apatite (phosphate) matrix (Miller, 1983). The presence of a number of inliers of basement rocks suggest vertical movement on various faults that post-date the Thelon Formation.

Northeast of Eyeberry Lake, a prominent north-northeasterly trending ridge of white quartzite extends 13 km from Eyeberry Lake to a small lake informally known as "L Lake" (Wright, 1967; Taiga Consulting Ltd., 1980). This ridge is typical of and traditionally correlated with the white quartzite (unit 9 of Wright, 1967) of the Aphebian age Hurwitz Group. However,

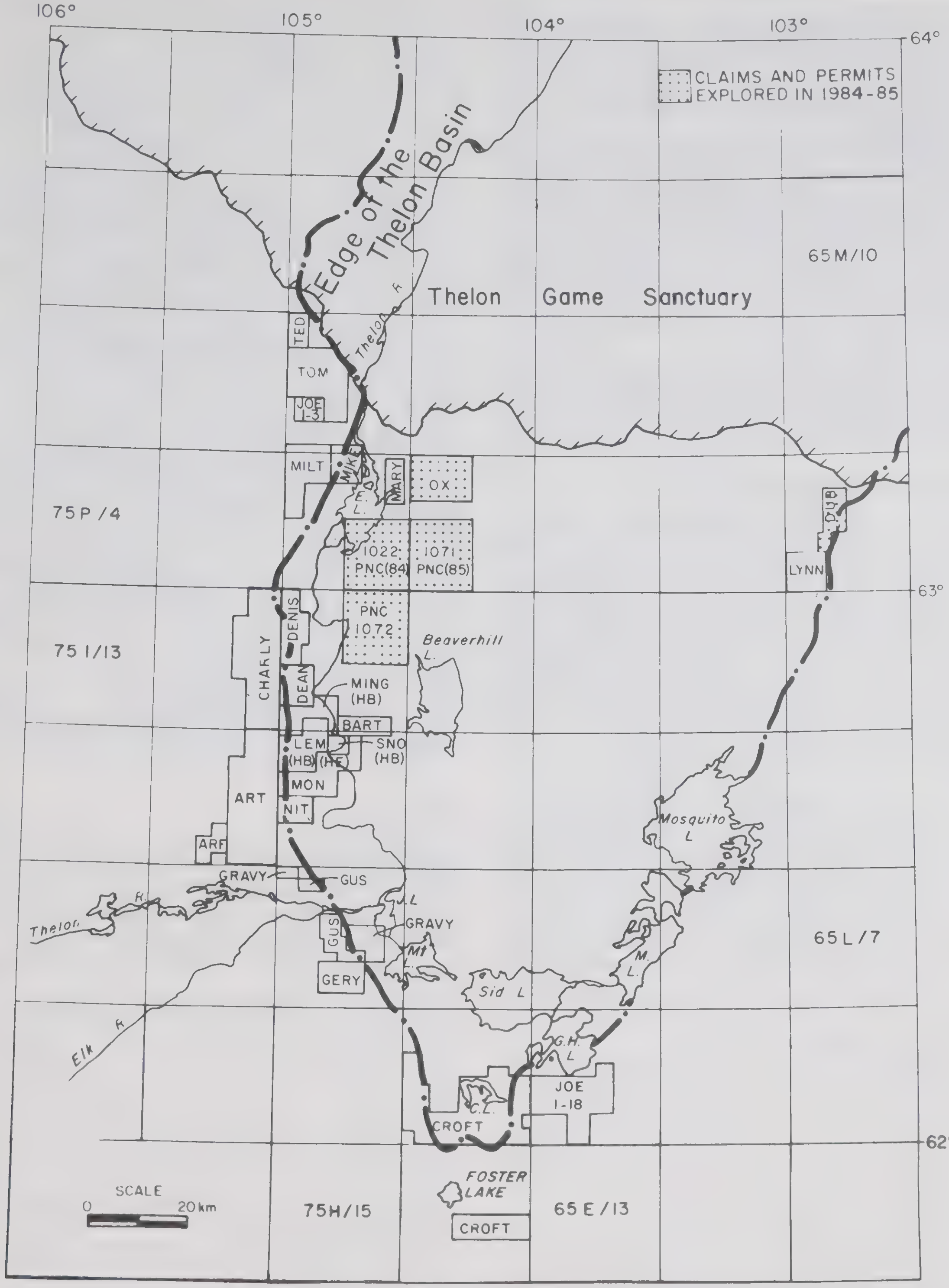

FIGURE 6-2: 1984-85 claims and permits - Western Thelon Plain. JL - Jim Lake, GHL - Gravel Hill Lake, ML - Mary Lake, MtL - Mantic Lake, UG - Urangesellschaft Canada Ltd., HB - Hudson Bay Oil and Gas Ltd., PNC - PNC Exploration (Canada) Co. Ltd.

Urangesellschaft Canada Ltd. claims:

ARF 1-2	75 I/10,15	JOE 1-3	75 P/7	MILT 1-10	75 P/2
BART 1-8	75 I/15	LYNN 2-6	65 M/2	GUS 1-10	75 I/7
DEAN 1-6	75 I/15	TOM 1-14	75 P/7	JOE 1-18	75 I/10
DENIS 1-7	75 I/15	MARY 1-4	75 P/2	ART 1-25	75 I/11
GERY 1-12	75 I/7	MIKE 1-5	75 P/2	CHARLY 1-20	75 I/14

PNC Exploration (Canada) Co. Ltd. claims:

CROFT 1-29	75 I/1
CROFT 30-35	75 H/16
OX 1-20	75 P/1
DUB 1-6	65 M/2

Hudson Bay Oil and Gas claims:

LEM 1-13	75 I/10	MING 1-11	75 I/15	MON 1-11	75 I/10
SNO 1-5	75 I/10	AN 1-3	75 I/15	NIT 1-5	75 I/10

the type area of Hurwitz Group rocks is many kilometres to the east. The topographic and geophysical expressions of this ridge indicate that it is a horst block uplifted above the overlying Thelon Formation sandstones along parallel faults that extend into the basement.

The basement to the Thelon Formation in the region of the permits is thought to contain Aphebian metasediments. Regional correlations suggest some of the Aphebian metasediments may be pelitic and/or graphitic in composition, a geological setting considered favourable for unconformity vein uranium deposits. In 1983, drilling by Urangesellschaft Canada Ltd. on the LEM claims, about 15 km south of Permit 1072, intersected graphite with uranium and gold, in the "Elk River gneisses" (Gibbins, 1985, p. 212).

Bedrock in the area is covered by extensive glacial deposits, including eskers, drumlins, till and paleostrandlines of postglacial Lake Thelon (Craig, 1964).

CURRENT WORK AND RESULTS

In the summer of 1984, PNC Exploration (Canada) Co. Ltd. contracted Questor Surveys Ltd. to fly Prospecting Permit 1022 and adjacent areas with their MARK VI INPUT EM system. Several grids were established on the permits (Fig. 6-3) and magnetometer-gradiometer, VLF-EM and DEEPEM surveys were done between the spring of 1984 and the fall of 1985. Reconnaissance geological mapping, boulder prospecting and lake sediment surveys were done during the summers of 1984 and 1985. Track Etch and Max Min II horizontal loop EM surveys were tried in selected areas.

1984:

The INPUT EM survey consisted of 2,172 km of line within a 17 by 25 km area. Magnetic gradients appear to reflect the contact between the Thelon Formation sandstone and basement granitic gneisses and a thickening of the Thelon Formation sandstone to the southeast. A number of discrete magnetic anomalies found throughout the east half of the survey area are believed to represent mafic intrusions in the crystalline basement. A linear magnetic feature trending northwesterly from the southeast corner of the survey area to Eyeberry Lake is interpreted as a mafic dyke.

The most anomalous area shown by the EM profiles coincides with "742 Lake" in the northeast corner of the survey (Grid C). However, this anomaly appears to be caused by unconsolidated lake sediments. Eyeberry Lake covers numerous weak EM responses that are thought to be derived from unconsolidated surface material.

Grid A was constructed east of Eyeberry Lake over a weak north-trending conductor. Grid B covers a possible extension of this trend. In the southeast part of the area (Grid D), a river and ponds may account for increased conductivity producing irregular EM anomalies.

Two small ponds and a bay of "742 Lake" correspond to anomalies in Grid E (Fig. 6-3).

The most encouraging follow-up results are from Grid A, in the north- central part of Prospecting Permit 1022, where both VLF-EM and DEEPEM conductors were detected. Results from Grids B and C follow-up did not reveal any promising targets.

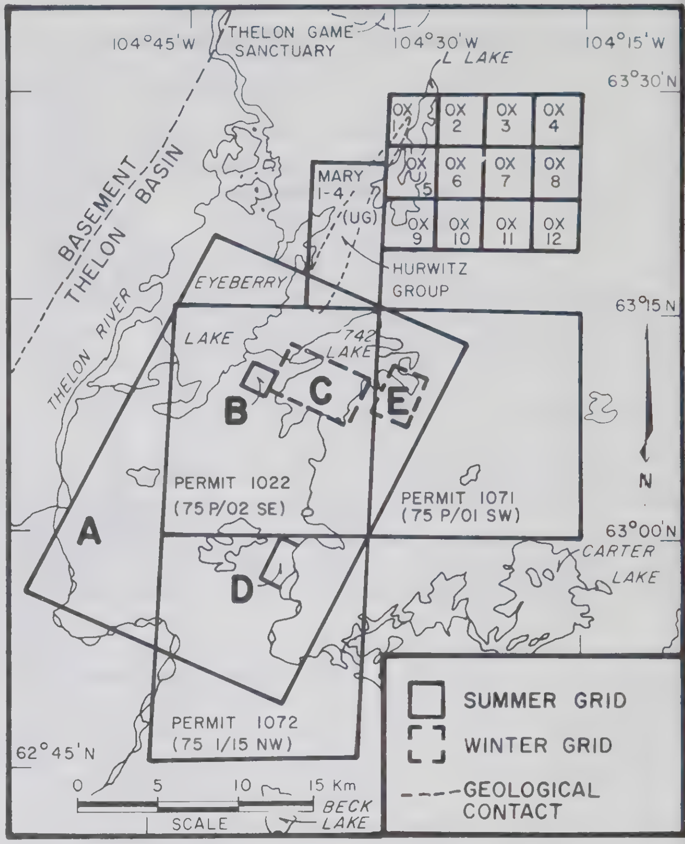

FIGURE 6-3: Eveberry Lake area, exploration grids of PNC Exploration (Canada) Ltd.

1985

Grid C (PP 1022) covers the southwest part of "742 Lake" and Grid E (PP 1071) covers the eastern most end of "742 Lake". Follow-up geophysical surveys on Grids C and E revealed only a few weak anomalies characteristic of shallow, horizontal, conductive lake-sediments.

Work on Grid D (PP 1072) is confidential at the present time.

DUNKEL LAKE PROJECT - DUB CLAIMS

PNC Exploration (Canada) Co. Ltd.	Uranium
2401 - 650 W. Georgia St.	65 M/2
Box 11571	63º07'N, 102º48'N
Vancouver, B.C., V6B 4N8	

REFERENCES

Eade (1981); Gibbins (1984, 1985); Laporte (1974, 1979); Wright (1967).

DIAND assessment reports: 081831, 081958.

PROPERTY

DUB 1-6.

LOCATION

The claims are 30 km west of Dubawnt Lake. They are immediately north of Urangesellschaft Canada Ltd.'s former LYNN claims and south of the Clarke River that defines the

southern boundary of the Thelon Game Sanctuary in this area (Fig. 6-2).

"Dunkel Lake" is an unofficial name for a 20 by 7.5 km lake at 63º00'N, 102º47'W. The area is about 580 km due east of Yellowknife and 360 km west-southwest of Baker Lake.

HISTORY

NTS area 65 M/2 was held as Prospecting Permit 128 by Canadian Delhi Oil from 1969 to 1970 (Laporte, 1974); Permit 373 by Urangesellschaft Canada Ltd. from 1976 to 1978 (Laporte, 1979); and Permits 715 and 751 by Hudson's Bay Oil and Gas Ltd. from 1980 to 1983 (Gibbins, 1984). DUB 1-6 were staked in February 1984.

From 1982 to 1984, PNC Exploration (Canada) Co. Ltd. did reconnaissance exploration work in the Dunkel Lake area. The work included magnetic, EM and scintillometer surveys, boulder prospecting, geological mapping, and rock, overburden, lake bottom and stream sediment sampling. Petrographic work and aeromagnetic interpretation were contracted out to consulting firms (Gibbins, 1985). Three grids were established: Grid A on DUB 4, Grid C on DUB 6 and Grid B immediately west of DUB 6.

Boulder prospecting in 1982-83 identified three west-northwesterly trending boulder trains of radioactive Thelon Formation in the areas of Grid A, Grid B and the former GRIZ 1 claim of Esso Minerals Ltd. Several boulders of radioactive basement rocks were also discovered, but are believed to have been transported a considerable distance from their source.

Both soil and lake sediment samples outlined an anomalous area on Grid A.

DESCRIPTION

The project area lies along the eastern boundary of the southwestern Thelon Basin, just south of the Thelon Game Sanctuary (Fig. 6-2). Basement rocks of Archean (Eade, 1981) or Aphebian (Wright, 1967) age underlie the eastern part of the claim group, while shallow-dipping Thelon Formation sandstone and conglomerate cover the western portion. North-northwest-trending diabase dykes are the youngest rocks in the area.

Radioactive zones of hematized sandstone were found on the expired adjacent LYNN claims by Urangesellschaft Canada Ltd. in 1980 (Gibbins, 1984, p. 210).

The basement rocks, probably Archean or Aphebian age, have been regionally metamorphosed to epidote-amphibolite and amphibolite facies. These include a north-northeast-trending paragneissic belt and orthogneissic complex, within which augen gneisses mark areas of major fractures. The basement rocks are generally of low radioactivity. These basement rocks are not favourable for hosting Lone Gull-type uranium deposits, but may be favourable for Athabasca-type unconformity vein-type uranium mineralization.

A sub-Thelon Formation regolith, up to 10 m thick, outcrops below the trace of the sub-Thelon unconformity. Radioactivity is typically less than 250 c/s SPP2, but can locally attain 500 c/s or 800 c/s SPP2.

The Thelon Formation has been subdivided into quartz arenite and lesser subarkosic sandstone, pebbly sandstone and intraformational conglomerate, and basal conglomerate. Radioactivity measures up to 500 c/s SPP2 and it is not uncommon for these rocks to contain 0.002-0.015% U_3O_8, up to 13.74% P_2O_5 and up to 0.040% ThO_2.

Fracture trends are recognizable as photo-geological lineaments. Easterly faulting was followed by northerly, then (finally) northwesterly faulting. Northwest-striking block faults exhibit both strike-and dip-slip displacements and offset the erosional trace of the sub-Thelon Formation unconformity in the west-central portion of the area. The Thelon Formation exhibits subhorizontal (0º-10º west dipping) bedding with variable strike directions. Subvertical joint sets, in both basement and Thelon Formation, are associated with high radioactivity and elevated U contents, especially within the latter rocks. An idealized cross-section for the Dunkel Lake area was constructed.

Chlorite, carbonate, sericite and saussurite alterations are present in the basement rocks. The saprolitic regolith is marked by hematite, kaolinite and sericite alterations. The Thelon Formation rocks here were subjected to hematite, limonite, sericite and (rare) illite alteration.

CURRENT WORK AND RESULTS

Coincident magnetic, electromagnetic, geochemical and radiometric anomalies in Grid A showed that this area has the highest potential for uranium. In 1984, follow-up work outlined geophysical, geochemical, Track Etch, radon and radon emanometer anomalies on Grid A. However, results from the other grids were discouraging.

The age of two samples of basement rock suggest the latest isotopic re-setting was 1,700 to 1,800 Ma B.P. A lithogeochemistry study showed U to be strongly correlated with Co and weakly with Ni and As.

The major thrust of the 1985 season was drilling (15 holes totalling 1,560.9 m) on Grid A (the northeast quarter of DUB 4). A few more line kilometres of magnetic and VLF-EM surveys were completed and a second Track Etch survey and multi-element soil and drill core lithogeochemisty studies were performed. The results of drilling and Track Etch work on the grid are confidential at press time.

NONACHO BASIN

The Nonacho Group is a conformable sequence of mainly continental sediments, consisting of conglomerates, lithic sandstones (arkose) and shales (Table 6-2), that have been deposited in an intracratonic, fault-controlled basin. They appear to be Middle Aphebian in age and are comparable to the Martin Group of northern Saskatchewan. Basement rocks are mainly Early Aphebian to Archean granites and gneisses, including numerous mylonite or cataclasite zones. A belt of Archean to Aphebian Tazin Group paragneisses extends northward from Saskatchewan into the Hill Island Lake area (Mulligan and Taylor, 1969; Bostock, 1984). Diabase dykes represent the last Precambrian events.

The geology of the Nonacho Lake area is summarized by McGlynn and others (1974), and studied in detail by Aspler (1985). Uranium-bearing minerals associated with granitic rocks include pitchblende and allanite. Within the Nonacho Group, uranium is found as pitchblende in narrow fracture fillings and small veinlets in quartz stockworks, commonly in deformed rocks.

TABLE 6-2 STRATIGRAPHY OF THE NONACHO GROUP FROM ASPLER, 1985

SPARROW DIABASE

INTRUSIVE CONTACT 1.7 Ga

TALTSON FORMATION
- red pelite member
- sandstone member
- pebbly sandstone member

THEKULTHILI FORMATION
- granite clast member
- milky quartz clast member
- quartz-arenite clast member
- polymictic clast member

NEWSHETHDEZZA FORMATION

CHIEF NATAWAY FORMATION
- intraformational sandstone breccia/conglomerate member
- conglomeratic member
- sandstone/mudstone member
- mixed member
- carbonate member
- siltstone member

TRONKA CHUA FORMATION
- pebbly pelite member
- drab mudstone member
- polymictic pebbly sandstone member
- monomictic pebbly sandstone member

HJALMAR FORMATION
- mudstone/carbonate member
- rhyolite member
- conglomeratic sandstone member
- breccia conglomerate member

UNCONFORMITY

UNDIFFERENTIATED ARCHEAN AND/OR APHEBIAN

Mineral exploration in the area has been sporadic over the years. Renewed interest in uranium in 1976 coincided with the release of Geological Survey of Canada Open Files 324, 325 and 326 (Hornbrook and others, 1976) which reported the results of lake sediment geochemical surveys, and the release of airborne gamma-ray survey Map 37075G (G.S.C. Uranium Reconnaissance Program, 1976). These results, combined with an earlier airborne radiometric study (Darnley and Grasty, 1972) and promising geology, resulted in considerable staking and exploration since 1976.

The 1979 level of exploration in the Nonacho area was higher than in any previous year, and several companies carried out major projects. This work included diamond drilling, airborne geophysical surveys, geological mapping and detailed systematic prospecting involving expenditures of $2 to $3 million. From 1980 to 1982, exploration tapered off, with only PNC Exploration (Canada) Ltd. working on major programs. Gibbins (1984, 1985) summarized the 1980-83 work.

Exploration was mainly for unconformity related uranium deposits similar to those found in northern Saskatchewan (e.g. Key Lake; Dahlkamp, 1978, 1979). Exploration techniques, which emphasized geophysical prospecting (Patterson and others, 1979), lake water and sediment geochemistry, and boulder tracing, are identical to those used in northern Saskatchewan. However, there is inconclusive evidence for a regolith below the sub-Nonacho unconformity.

Numerous other types of uranium occurrences, particularly Beaverlodge-type pitchblende veins related to mylonite, fine-grained mafic dykes and albitite host rocks, have been found in the area, but so far none have shown economic potential.

Bostock (1982, 1984) remapped the basement rocks south and southwest of the Nonacho Basin in NTS 75 C. Aspler (1985) mapped and studied the structure and sedimentation of the Nonacho Basin sediments.

THEKULTHILI LAKE PROJECT

PNC Exploration (Can.) Co. Ltd.	Uranium
Box 11571, Vancouver Centre	75 C/13;D/16;E/1,8;
2401 - 650 W. Georgia St.	75 F/4,5,12
Vancouver, B.C., V6B 4N8	61°00'N, 110°00'W

REFERENCES

Bostock (1980, 1982, 1984); Gandhi and Prasad (1980); Gibbins (1983a,b, 1984, 1985); Gibbins and others (1977); Henderson (1937, 1939a, 1939b); McGlynn (1966, 1978); Mulligan and Taylor (1969); Taylor (1971).

DIAND assessment reports: 081759, 081815 and 081908.

PROPERTY

A) MacInnes Lake - Tronka Chua Lake,	KULT 11, 52, 74, 75, 82
B) Thekulthili Lake,	KULT 13
C) Salkeld Lake - Hjalmar Lake,	KULT 59, 78

LOCATION

These and numerous other KULT claims cover most of the Nonacho Group-basement unconformity in the Thekulthili Lake area (Fig. 6-4). This area is about 300 km southeast of Yellowknife and 160 km north of Fort Smith (Fig. 6-1).

HISTORY

In 1977, Kenting Earth Sciences Ltd. carried out an airborne radiometric survey over the southern Nonacho Basin for PNC Exploration (Canada) Co. Ltd. The RED and NP claims were staked to protect anomalies detected by this survey. In 1978, additional reconnaissance lake-sediment and airborne radiometric surveys in adjacent areas led to the staking of the KULT claims. Detailed mapping and soil sampling were done in several areas (Gibbins, 1983a).

The 1979 program included lake sediment and soil surveys, geologic mapping, ground radiometric and VLF-EM, airborne EM and additional staking (Gibbins, 1983b). Regional mapping and radiometric prospecting were carried out over most of the claims and a number of anomalous areas was identified for more detailed work. Most of the important anomalies are associated with fractures containing prominent hematite, minor pyrite-chalcopyrite and yellow uranium oxides. Geological work shows that the Nonacho Group-basement contact is nonconformable, but locally defined by faulting.

Detailed geology, radiometric, soil geochemistry and/or radiometric surveys were done over grids cut on NP, RED and KULT 12 and 13. Uraniferous fractures were found in the basement igneous complex on Grids F and G on KULT 13.

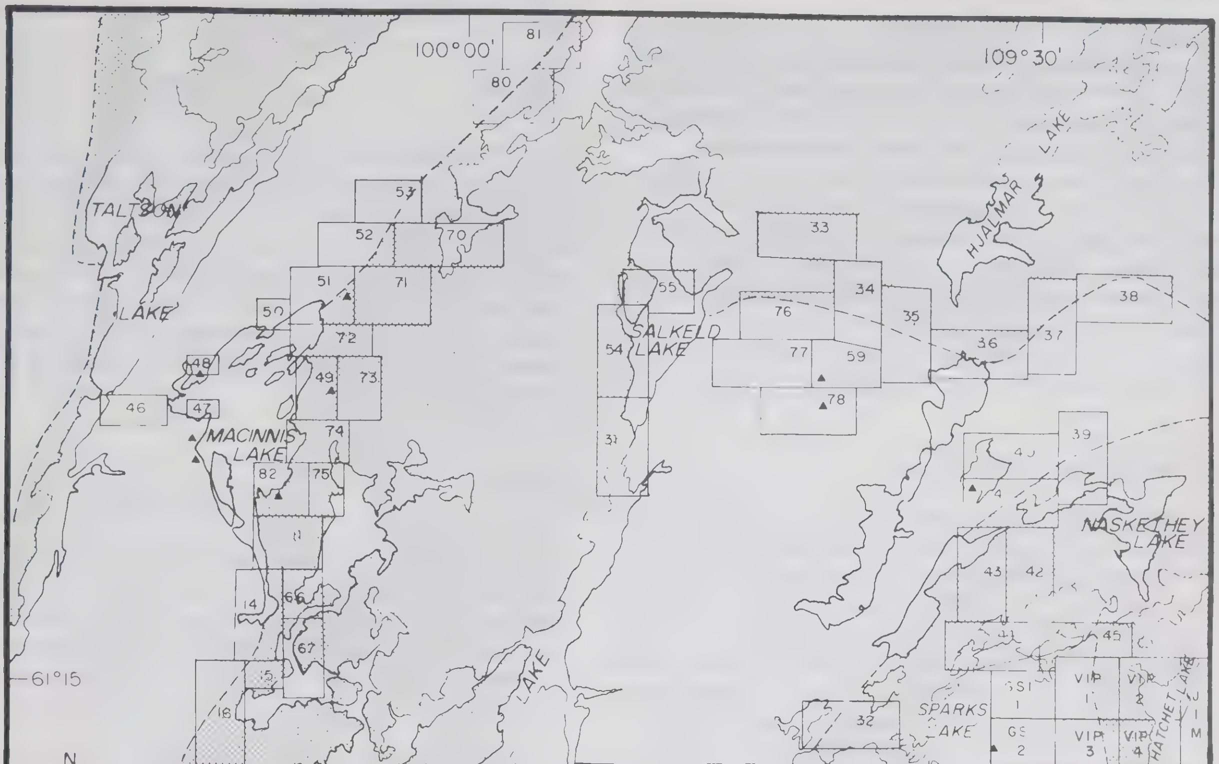
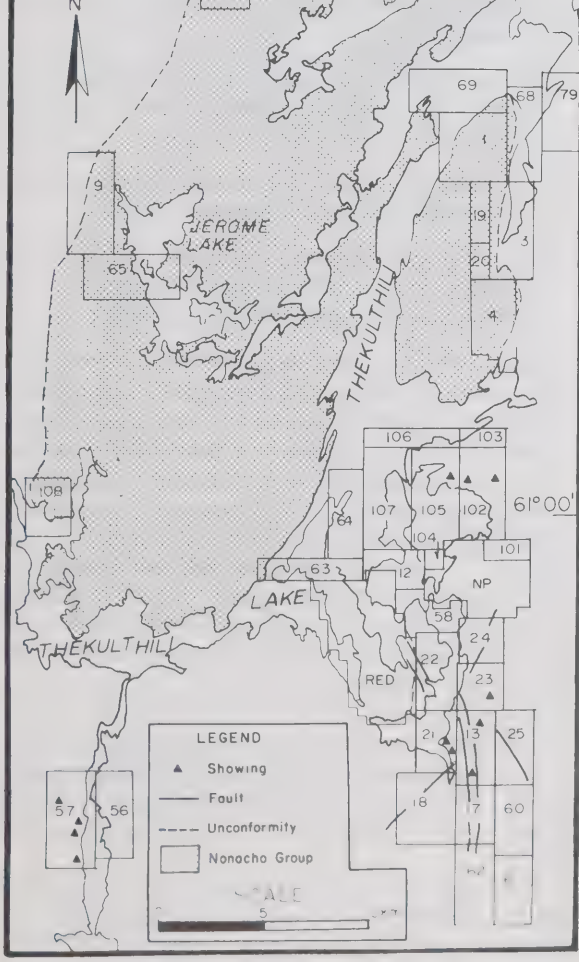

FIGURE 6-4: KULT claims, Thekulthili Lake area

Thirty-two radiometric anomalies, detected by the 1977 airborne survey, were ground checked and 1,800 km of airborne Tridem EM survey were flown by Kenting Earth Sciences Ltd.

The 1980 field work included detailed mapping, radiometric, VLF-EM and geochemical surveys, trenching, a Track Etch survey and additional claim staking. Over 5000 line km of airborne magnetic, VLF-EM and radiometric surveys were flown over KULT 31-59 (Gibbins, 1984).

The 1981 exploration program for the South Thekulthili Lake Project consisted of mapping, prospecting, regional radiometric, geochemical and ground geophysical surveys, detailed grid surveys (geology, geochemical soil sampling and ground magnetics), blasting and trenching, 820 km of heliborne geophysical surveys of KULT 18, 22-24 and 56-57, 3142 m of drilling (KULT 13 and RED 31) and staking new claims (KULT 60-64).

Detailed work on the grids included petrographic studies, rock geochemistry, mapping, soil sampling, lake-sediment sampling, scintillometre, VLF (Geonics EM-16), magnetic and Track Etch surveys (Gibbins, 1984).

Work on the North Thekulthili Lake Project (KULT 11, 14-16, 31-55 and 59) was mainly ground follow-up (prospecting, mapping and radiometric surveys) of a 1981 heliborne spectrometre survey (Gibbins, 1984).

During the 1982 and 1983 field seasons, PNC Exploration (Canada) Ltd.'s exploration work was mainly directed toward detailed geological, geophysical, geochemical and petrographic studies (Gibbins, 1985). Several new claims were staked (KULT 74-82) and several drilling programs were carried out. The two main areas of drilling were KULT 13, southeast of Thekulthili Lake (41 holes),and KULT 49, northeast of MacInnes Lake (22 holes) (Gibbins, 1985, p. 228-236).

DESCRIPTION

The oldest rocks in the Thekulthili Lake area are basement granites and gneisses of Archean to Aphebian age. These rocks are unconformably overlain by conglomerate, arkose and argillite units of the Nonacho Group of undefined Proterozoic age. The Nonacho and basement rocks have been faulted and folded along north-northeast-trending axes. The youngest rocks are undeformed diabase dykes.

The area is at the mutual corners of geological maps by Henderson (1939a), Mulligan and Taylor (1969), Taylor (1971) and Bostock (1982, 1984). McGlynn (1966, 1978) mapped part of the claim area in detail; Gandhi and Prasad (1980) the MacInnes Lake area. Bostock (1980, 1982) and McGlynn and others (1974) have also discussed the geology of parts of the area.

CURRENT WORK AND RESULTS

Summer field work in 1984 included ground geophysical, geochemical and petrographic studies, as well as geological mapping. A winter (February-May) drill program consisted of 28 holes (4,825 m) on KULT 13 and the summer work consisted of 60 holes on KULT 13, 59 74 and 82 (6,455 m). In June, 1985, 10 holes (1,385 m) were drilled on KULT 59 and 9 holes (931 m) were drilled on KULT 78 in an area east of Salkeld Lake. Work done on the KULT claims is summarized in Table 6-3.

For convenience the following descriptions of individual claim groups are classified into three geographic sub-areas: A) MacInnes Lake - Tronka Chua Lake; B) Thekulthili Lake; C) Salkeld Lake - Hjalmar Lake.

A) MACINNES LAKE - TRONKA CHUA LAKE

KULT 11: 75 E/8
1°18'N,101°10'W

KULT 11 is east and south of the south end of MacInnes Lake and covers part of the western Nonacho Group-basement contact (Henderson, 1939a). Gandhi and Prasad (1980) described the Kult and Pyramid showings on KULT 11 and KULT 14 (Fig. 6-5) as veins in basement rocks. The 1980 work on these claims consisted of detailed geologic mapping and radiometrics, rock geochemistry, trenching and sampling.

Finely disseminated pitchblende, secondary uranium and copper sulphide minerals are present in quartz-rich mylonite discovered on KULT 11 in 1979. A second radioactive area with uranium staining is 75 m to the northwest in a silicified zone at a dyke contact.

In 1982, trenching and prospecting were done on KULT 11 and 14. This work was concentrated in areas of copper-uranium-rich fractures found in silicified zones associated with altered areas of northwest-trending andesitic dykes.

CURRENT WORK AND RESULTS

The 1983 summer field program resulted in the discovery of numerous uranium showings on KULT 82, immediately north of KULT 11 (Fig. 6-4 and 6-5). In 1984 (DIAND assessment report 081815), the KULT 82 grid was extended southward onto KULT 11.

The geology of KULT 11 is continuous with that of KULT 82. Oligomictic conglomerate in the east part of the grid is in fault contact with the basement gneiss-granite complex. No significant uranium was found in the grid area.

KULT 52: 75 E/8
61°27'N, 110°06'W

KULT 52 lies along the Nonacho Group-basement contact, about 2 km northeast of the northern tip of MacInnes Lake, or immediately north of KULT 51 and 71 (Fig. 6-4). In 1984, a lake-bottom Track Etch survey confirmed three anomalous radon clusters, originally detected in a 1983 survey of an unnamed lake in KULT 52. The clusters are believed to be caused by uranium along faults in oligomictic conglomerate. However, these anomalies are not believed to have economic potential.

KULT 74, 75, 82: 75 E/8
61°20'N, 110°10'W

The claims are on the western margin of the main area of Nonacho Group sediments. The southeast shore of MacInnes Lake runs through the western part of the area.

Uranium showings in the claim area have been divided into four types based on their host rock and mode of occurrence as follows:

1) Stockwork systems of veins in north-trending mylonite zones.
2) Stockwork-like veins in basal oligomictic conglomerate (Cole Prospect in Figure 6-5 and Gandhi and Prasad, 1980).
3) Uranium minerals distributed sporadically in fractures or disseminated within basement rocks.
4) Low-grade showings associated with dark, heavy mineral layers in the quartz-pebble sandstone unit of the Nonacho Group (Moffat Showing).

Types 3 and 4 anomalies are not considered primary targets in this area because they are sporadic, lack continuity and are generally low grade.

Numerous Type 1 showings have been mapped. The host rock, mylonite, exhibits various stages of cataclasis and relicts of psammitic gneiss. Pitchblende is in northerly to north-northeasterly trending, vertical to sub-vertical veins. Associated minerals, in decreasing order of abundance, are chlorite, hematite, calcite, pyrite, arsenopyrite and malachite.

The Cole prospect, in oligomictic conglomerate of northeast KULT 82, is a Type 2 showing. It was formerly staked as the BM claims, (Gibbins and others, 1977, p. 75; Gandhi and Prasad, 1980).

Pitchblende and secondary yellow uranium minerals fill fractures and are closely associated with calcite, and to a lesser extent, with hematite. Gold is associated with the uranium (Shell Canada Resources Ltd.; DIAND assessment report 080170).

An integrated geological, geophysical (magnetics, VLF-EM and radiometric) and geochemical (Track Etch, soil samples and radon gas) program was carried out in 1983.

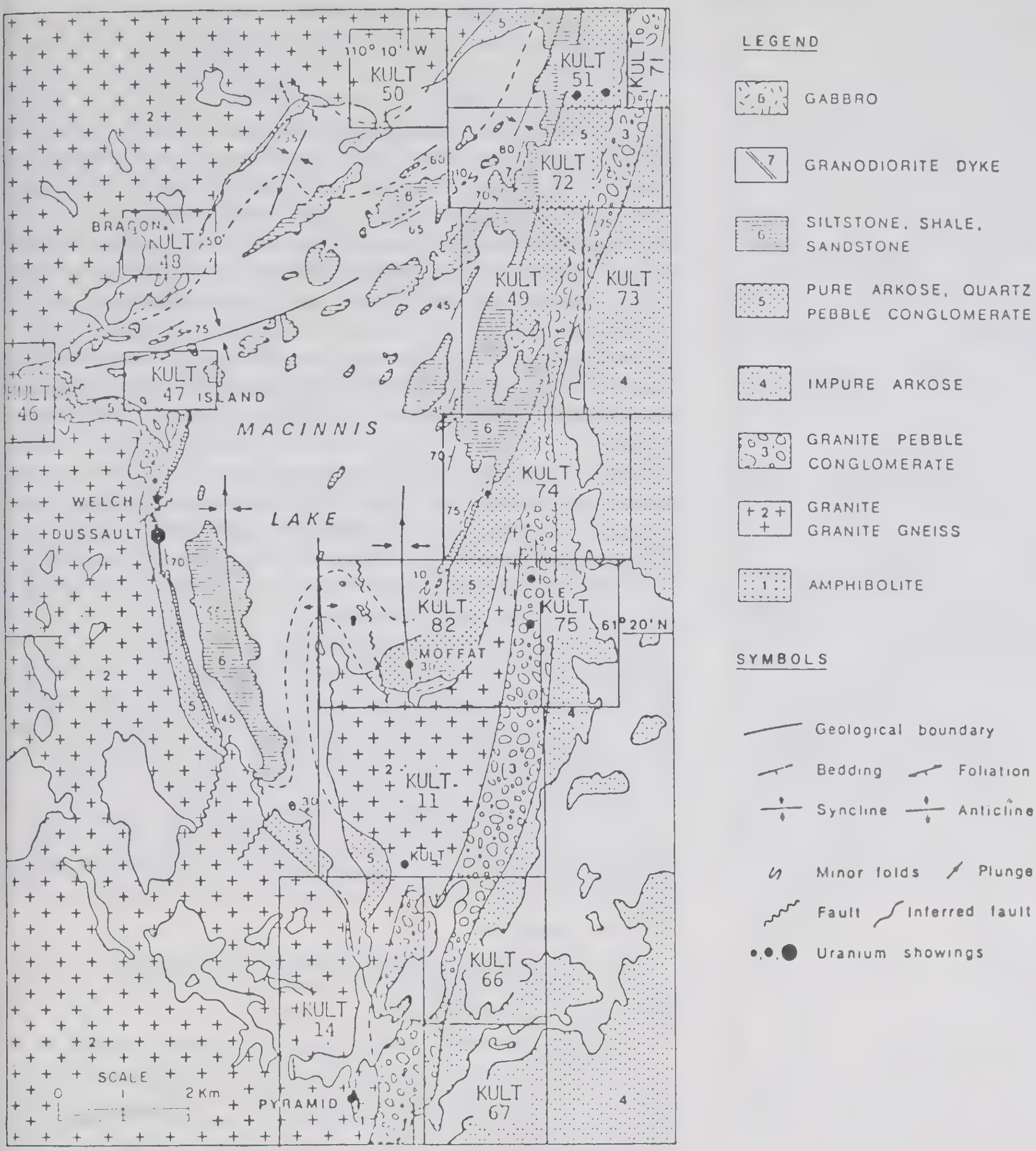

FIGURE 6-5: Geology and uranium occurrences of the MacInnis Lake area, District of Mackenzie (from Gandhi and Prasad, 1980).

TABLE 6-3 SUMMARY OF 1984-85 WORK ON PNC EXPLORATION (CANADA) CO. LTD. KULT CLAIMS: NONACHO-THEKULTILI LAKE area.

KULT 11	Detailed geology - 1984
KULT 52	Track-etch (lake bottom) -1984
KULT 74, 75, 82	Emanometer - randon - 1984 Drilling (36 holes - 4,451 m) - 1984
KULT 13	Drilling (3 holes - 351 m) - 1984 Drilling (28 holes 4,825 m) - 1984 (winter)
KULT 59	Drilling (21 holes - 1,652 m) - 1984 Drilling (10 holes - 1,385 m) - June, 1985
KULT 78	Detailed geology - 1984 Track-etch - 1984 VLF-EM - 1984 Magnetometer - 1984 Drilling (9 holes - 931.3m) - June, 1985

CURRENT WORK AND RESULTS

Detailed mapping in 1984 outlined two anomalous zones in mylonite. A radon emanometre survey detected numerous readings above the threshold value, but these tended to be isolated, discontinuous and disappointing (DIAND assessment report 081815).

Thirty-six drill holes (4,452 m) probed anomalous zones previously outlined by prospecting and mapping. Most of this drilling was done on the Cole prospect (14 holes), northeast KULT 82, where uranium-rich stockwork veins occur in basal oligomictic conglomerate. A north-trending mylonite-conglomerate contact, in east-central KULT 82 (Fig. 6-5) about 500 m south of the Cole prospect, was also drilled (14 holes). An additional 6 holes were drilled on the southern extension of this trend in southeast KULT 82, and 2 holes were drilled to test a Track Etch anomaly near the center of KULT 74. The drilling showed that the conglomerate-basement contact is at least 400 m below the surface at the Cole prospect.

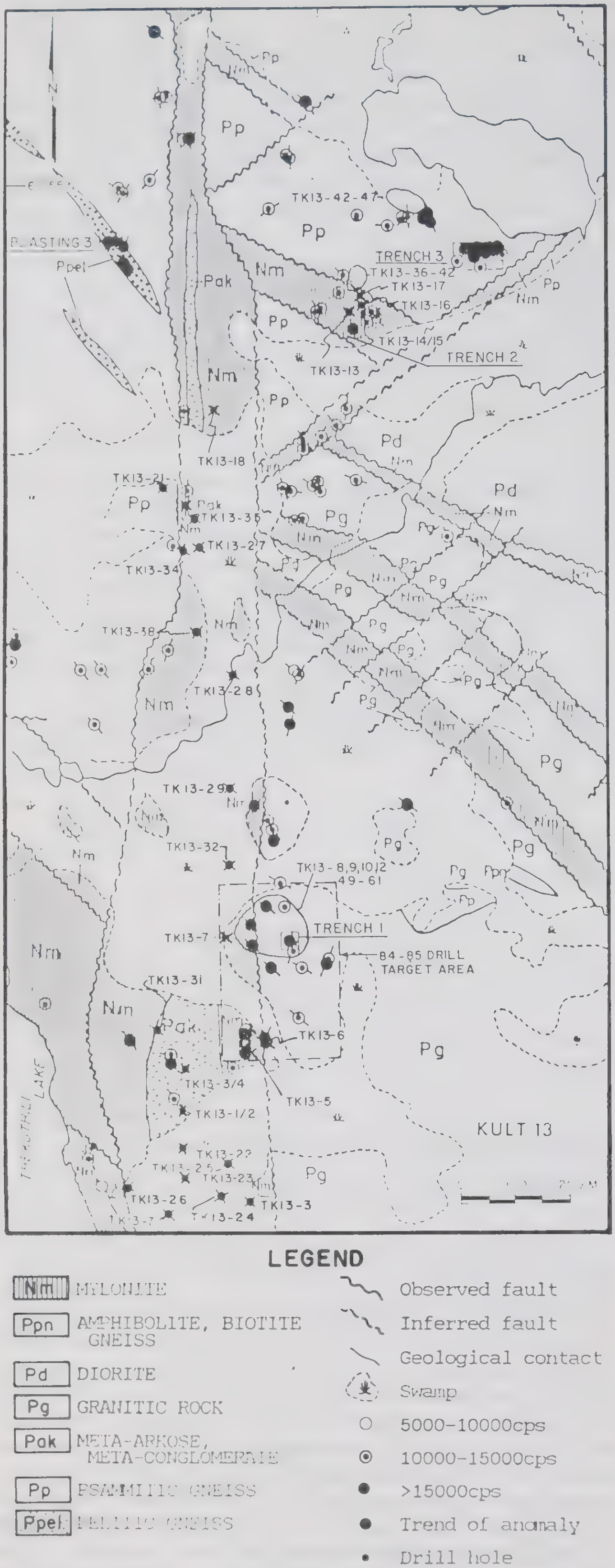

FIGURE 6-6: Geology and drill hole localities, KULT 13 claim, PNC Exploration (Canada) Co. Ltd.

B) THEKULTHILI LAKE

KULT 13: 75 C/16
60°55'N, 109°58'W

KULT 13 is immediately east of the southeastern-most tip of Thekulthili Lake (Fig. 6-4). This area contains Nonacho Group sandstone, narrow andesite dykes, mylonite and basement granite, diorite and paragneisses (Fig. 6-6).

Paragneiss underlies most of the western and northeastern parts of the claim area. Fine-grained pelitic gneiss forms concordant northwest-trending lenses in psammitic gneisses of variable lithology.

Medium-grained sandstone is distributed in lens-shaped zones within the central part of the main north-trending mylonite belt. Rare coarse and fine grained phases are present as well.

Mylonites correspond to faults and usually grade into the surrounding rocks. They trend in three directions: north, northwest and northeast. At the north and south boundaries of the claim, the large north-trending mylonite zone is 250 and 500 m wide respectively (Fig. 6-6). In places, original lithologies are preserved in the mylonite zones.

More than 40 radioactive anomalies on KULT 13 are concentrated in mylonite zones and the granitic rocks (in the south), in granitic rock surrounded by mylonites (in the central-east), or in paragneiss (in the northeast). The anomalies trend northeast, northwest and north. They are considered to be related to fault systems trending in the same directions.

Uranium minerals are generally found along fractures and are associated with chlorite, carbonates, hematite, quartz, sericite and base metal sulphides such as pyrite, galena, chalcopyrite and sphalerite. This is common in hydrothermal uranium deposits.

Eight of the main mineralized areas were surveyed, trenched and blasted in 1980-81 and twenty holes (2,942 m) were drilled and probed in 1981.

In the spring of 1982, nine holes (1,821.5 m) were drilled on KULT 13 (6 holes, TK 13-24 to TK 13-29), and adjacent northernmost KULT 17 (3 holes, TK 17- 1 to TK 17-3). The target of all the holes, except TK 13-26, was the meta-arkose unit (Pak) within the north-trending mylonite zone in central KULT 13 and 17 (see Fig. 6-6).

The arkosic sandstone found in the mylonite zone is massive and mainly medium to coarse grained. It contains poorly sorted quartz and red clast granules. Pebble-bearing layers are often encountered. The unit is in fault contact with the surrounding mylonite. It appears to pinch out south of hole TK 13-23 and does not extend into KULT 17, as was previously thought. Up to 240 ppm uranium was encountered in arkose in holes TK 13-27 and TK 13-28, but not in adjacent holes. Up to 950 ppm uranium was also detected in the mylonite that forms the footwall of the arkose in TK 13-27. There are a large number of radiometric anomalies in the footwall mylonite which are partly associated with base metal sulphides such as galena, sphalerite, chalcopyrite and pyrite (DIAND assessment report 081564).

During the 1982 and 1983 field seasons, exploration in the KULT 13 area consisted of detailed grid mapping, trenching (about 6 cubic metres), geophysics (magnetometre - 1982, VLF EM - 1983) and drilling (21 holes - 2,358.7 m in 1982 and 11 holes - 1,145.2 m in 1983). In 1982, trenches were made

in the extension of a uraniferous andesite dyke and a radioactive fracture in the dyke, and a radioactive fracture in mylonitized psammitic gneiss on KULT 23 and 24, respectively. The latter proved to be the more interesting with fracture fillings of pyrite and calcite, traces of pitchblende, chalcopyrite, galena and secondary uranium minerals. The magnetic survey outlined an andesite dyke in KULT 13, but failed to show in KULT 23. The VLF-EM survey conductors defined a zone of extreme granulation with the mylonite zones, as well as crosscutting structures. A radon survey indicated anomalies that correspond with and confirm a 1980 Track Etch survey.

Hole TK 13-48, drilled in southern KULT 13, intersected 42 m (apparent thickness) of anomalous mylonite. Other 1982 drill holes also intersected anomalous zones, but are not considered to have economic potential due to their low grade and discontinuous nature. Follow-up drilling around TK 13-48 in 1983 indicated a 150 m long stockwork consisting of several mineralized zones at the junction of north- and east-trending mylonites. Pitchblende, hematite, chlorite and calcite occur in veins and stringers.

CURRENT WORK AND RESULTS

In the winter months of 1984, the drilling program on KULT 13 was continued with 28 new holes, TK 13-62 to TK 13-89 (4,825 m), in the south-central part of the claim, near the boundary with KULT 17 (Fig. 6-6). Another 3 holes, TK 13-90 to TK 13-92 (351 m), in the summer of 1984 completed the drill program (DIAND assessment reports 081759, 081815).

During the past three years, 49 drill holes have been targeted in the south-central area of KULT 13, delineated as the "target area" on Figure 6-6. Drill hole spacing in the area is 50 to 100 m.

C) SALKELD LAKE-HJALMAR LAKE

KULT 59: 75 F/5
61°23′N,109°41′W

KULT 59 and the adjoining KULT 78 are between Salkeld and Hjalmar Lakes in the northern part of the project area (Fig. 6-4). Both are underlain by paragneiss, granite gneiss and other granitic rocks of the basement complex. A cataclastic zone is related to faulting in the west part of KULT 59.

A 1980 airborne survey identified numerous radiometric anomalies in the area of KULT 59. Subsequent ground surveys over some 4.3 line km of grid outlined three areas of interest with count rates from 19,500 to 28,000 cps. These zones were trenched in 1981.

Prospecting of KULT 59 identified numerous radiometric anomalies, mainly in the southwest corner of the claim. They are distributed in several zones within 500 m of a major north-northwest-trending fault and/or adjacent east-northeast-trending structures, mainly on the east side of the fault. Uranium, present as pitchblende in narrow fractures in paragneiss, prompted the staking of KULT 76-78 and the establishment of a detailed grid in the area as a base to identify lithological, geochemical and structural controls. Work included geological mapping at 1:2,500 scale, a radiometric survey, 15 line km of total field magnetics and VLF EM (Cutler and Seattle Stations), a 57-sample Track Etch survey and a 56-sample geochemical soil survey. Rock samples were collected and used to prepare 66 petrographic reports or descriptions, and 93 geochemical rock chip assays.

Three trenches were opened up in highly radioactive zones east of a large lake in the south-western corner of KULT 59. One trench gave assays of 1.36% U_3O_8 over 2.1 m and a grab sample of 13.98% U_3O_8. Alteration minerals include hematite, epidote, chlorite, sericite and carbonate.

In 1983, KULT 76-78 were prospected and mapped and several new trenches were excavated in the anomalous southwest area of KULT 59. A second type of uranium showing was recognized: a large, but low grade, disseminated type hosted in hornblende gneiss. This type of deposit is not structurally controlled.

CURRENT WORK AND RESULTS

Area a: vicinity of trenches 82-3/83-4 and 83-5 (1984: 14 holes - 1,276 m; 1985: 7 holes - 1,106 m) (DIAND assessment reports 081815 and 081908). The trenches are in a large 100 by 200 m area containing numerous radiometric anomalies. They are near the intersection of two geophysically inferred fault structures that are related to major regional fault trends. Four of eight holes were drilled to test uranium mineralization associated with trenches 83-3/83-4.

Six holes were drilled in 1984 to test a uraniferous zone exposed in trench 83-5.

Area b: 120 m south of Area a (1984: 3 holes-179 m).

In 1984, 3 holes were drilled in this area.

Area c: 250 m southeast of Area a in the vicinity of trench 82-1 (1984: 4 holes - 193.6 m; 1985: 3 holes - 279 m).

In the summer of 1984, 4 holes tested for the extension of a biotite-pitchblende vein discovered in trench 82-1.

These results were confidential at the time of publication.

KULT 78 75 F/5
61°22′N, 109°41′W

KULT 78 is south and southwest of KULT 59 (Fig. 6-4). It is underlain by basement gneisses, mainly quartz-feldspar gneiss or migmatite and quartz-feldspar-biotite gneiss. Anomalous radioactivity was discovered in an area of swamp and felsenmeer in 1983. This area is in the northeast quarter of KULT 78.

CURRENT WORK AND RESULTS

In the summer of 1984, the eastern half of the claim was gridded, mapped, prospected and surveyed with spectrometres (DIAND assessment reports 081815, 081908). A more detailed grid was established and additional mapping, VLF-EM, magnetic and Track Etch surveys were conducted.

In June, 1985, nine vertical holes (931 m) were drilled on the KULT 78 detailed grid.

The drill results were confidential at the publication deadline.

OTHER CHURCHILL PROVINCE

The geology of the Churchill Province in the District of Mackenzie is known principally from the results of reconnaissance mapping. Summaries of the geology of the Churchill Province have been prepared by McGlynn (1970) and Davidson (1972b). Only recently has more detailed work become available for parts of the region (Aspler, 1985; Bostock, 1982, 1984).

Fraser (1978, p. 195) summarized the metamorphism in the area as follows:

> The northwestern Churchill Province is underlain mainly by quartzofeldspathic gneiss and sub-ordinate metavolcanic and metasedimentary rocks of Archean age which have been metamorphosed to amphibolite and granulite facies. Metamorphism to amphibolite facies probably took place during the Kenoran Orogeny. Metamorphism to granulite facies, characterized in the north, by biotite-hornblende-hypersthene assemblages, and in the southwest by garnet- cordierite-sillimenite-spinel assemblages, is possibly pre-Kenoran. Early to mid-Aphebian, greenschist to lower amphibolite facies metamorphism recognized in Aphebian strata at Great Slave Lake, may elsewhere overprint amphibolite and granulite facies rocks.

SNOWBIRD GOLD PROJECT - PROSPECTING PERMIT 1011, BIRD 1-4 AND SNO 5 CLAIMS

Golden Rule Resources Ltd.	Gold, Silver
150, 1300-8th Ave. S.W.	65 D/2,3,7
Calgary, Alta., T2R 1B2	60°15'N,103°W

REFERENCES

Eade (1981); Gibbins (1984, 1985); Laporte (1974b, 1983); Ridler (1971); Ridler and Shilts (1974); Schiller (1965); Taylor (1963).

DIAND assessment report: 081852.

PROPERTY

Prospecting Permit 1011; BIRD 1-4, 7-11; SNO 5.

LOCATION

The claims are all in the Snowbird Lake area, in the southeast corner of the District of Mackenzie, almost midway between Yellowknife (650 km to the west-northwest) and Churchill, Manitoba (550 km to the east-southeast). Geologically, the area lies at the southwest end of the Ennadai Lake-Rankin Inlet volcanic belt (Ridler, 1971; Ridler and Shilts, 1974).

Bourassa Lake is in the southwest corner of Prospecting Permit 1011. The BIRD claims are south and south-southwest of Bourassa Lake and SNO 5 is 5 to 6 km east of the center of Bourassa Lake (Fig. 6-7).

HISTORY

There is little record of mineral exploration activities in the Snowbird Lake area, however, there is evidence of unrecorded drilling activity on the BIRD claims, presumably for massive sulfide deposits. Known mineral showings in the region include the Rochon Lake "massive sulfide deposit" (Laporte, 1983, p. 76-78); the COP gold vein (SNO 1 and 2) (Schiller, 1965, p. 14-16); and the 'N occurrence' (SNO 3 and 4) a base metal-silver vein, discovered by Canadian Homestead Oil Ltd. in 1972 (Laporte, 1974b, p. 4).

In 1969, Canadian Aero Mineral Surveys Ltd. flew a combined EM, magnetic and gamma ray spectrometer survey over NTS area 65 D/3, 4 and 7 on behalf of Canadian Homestead Oil Ltd., holders of Prospecting Permits 138 to 140. Follow up work by Trigg, Woollett and Associates on behalf of Imperial Oil Enterprises Ltd. resulted in the discovery of the N occurrence, a silver-copper-lead-zinc showing (Laporte, 1974b, p. 3-4). In 1977, Scintrex Ltd. flew EM and magnetometer surveys of NTS area 65 D/16 (Prospecting Permit 448) for Gulf Minerals Canada Ltd. (Laporte, 1983, p. 76-77).

In 1981, Golden Rule Resources Ltd. collected and analyzed 245 lake sediment samples, and identified several gold and arsenic anomalies in the area (Gibbins, 1984, p. 278-279). Follow-up work in 1982-83 included prospecting, claim staking, and sampling of favourable boulders and showings both old and new (Gibbins, 1985).

The SNO claims were staked in 1981, BIRD 1-4 in 1982 and BIRD 7-11 in 1983, and Prospecting Permit 1011 was granted February 1, 1984.

DESCRIPTION

All of the claims and Permit 1011 are underlain by Archean sediments and volcanics of the Ennadai Lake - Rankin Inlet Belt (Ridler and Shilts, 1974; Ridler, 1971; Eade, 1981). Taylor (1963) described the volcanics as mostly basalt, but also tuffs, laminated metavolcanics and hornblende-feldspar gneiss. Most of the basalt is massive; some flows display poorly developed pillows and others show scoriaceous tops and flow top breccias. Greywacke is interbedded with the flows near Bourassa Lake. The sedimentary rocks consist of greywacke and quartzite. Most of the greywacke shows a well-developed fine lamination, but massive units are found as well. The quartzites, more extensive than the greywackes, locally show cross-bedding or, more rarely, graded bedding.

The northeasterly trending belt of supracrustal rocks, between Kasba Lake and Snowbird Lake (Fig. 6-7), lies between a prominent gravity high to the west and a gravity low to the east. A prominent magnetic high, which runs the length of the BIRD claims, is due to magnetite-oxide facies iron formation within a unit of siliceous clastic metasediments.

The supracrustal strata dip to the west with shallow to moderate dips (Fig. 6-8) and a tectonic foliation cuts the bedding at a low angle. The eastern half of the claims and permit are underlain by older mafic metavolcanics that include a high proportion of isoclinally-folded banded tuffs. Siliceous clastic metasediments, including various facies of iron formation, overlie the mafic volcanics and are intercalated with grey-

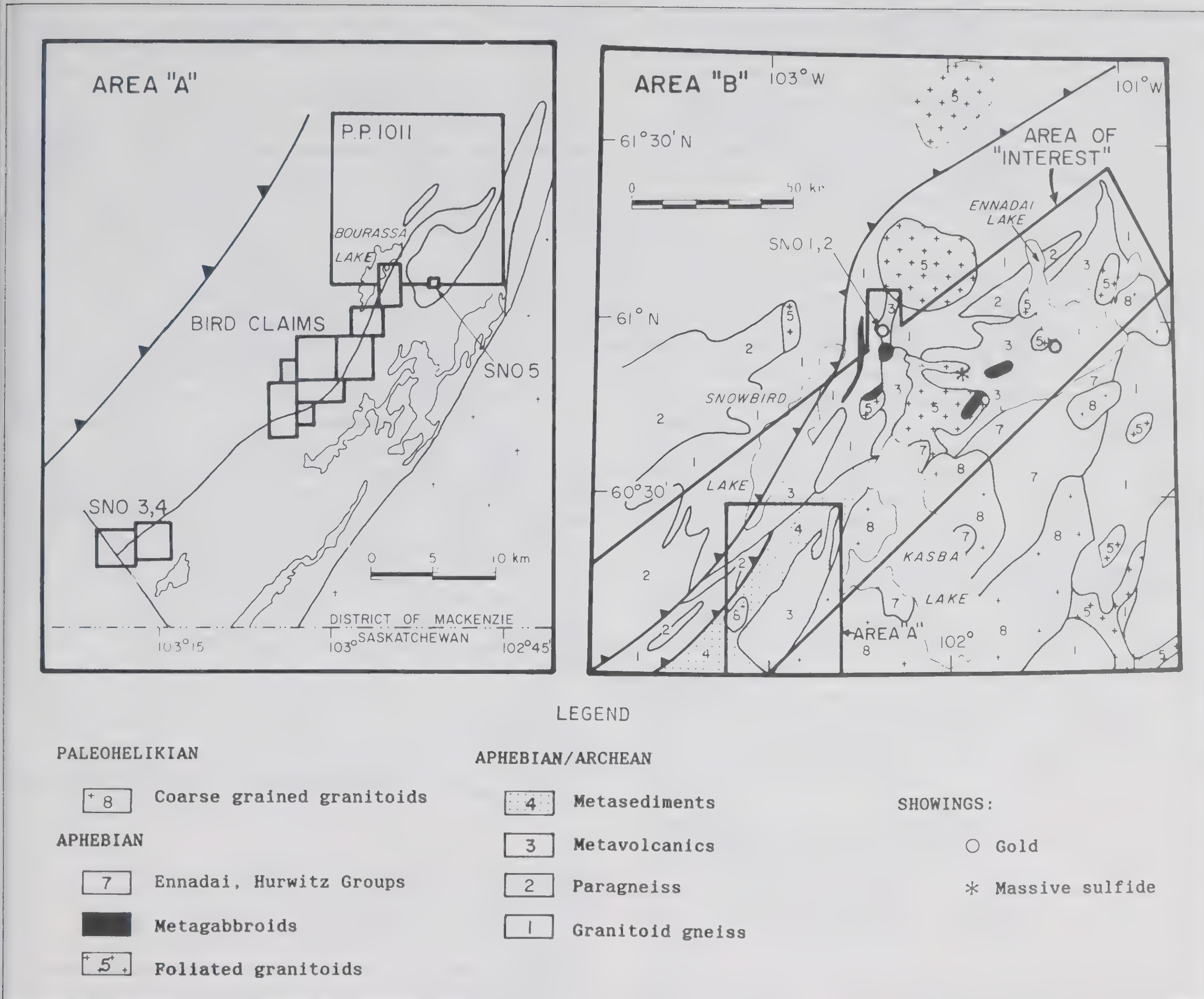

FIGURE 6-7: Regional geology of Snowbird Lake area, showing Golden Rule Resources Ltd.'s claims and permits.

wackes that cover the western half of the area. Deformed granitoid gneiss and migmatite post-date and enclose the volcanic-sedimentary supracrustal belts.

CURRENT WORK AND RESULTS

In January, 1984, Anaconda Canada Exploration Ltd. obtained the right to earn a 50% interest in the mineral holdings. They undertook a summer program of geophysical interpretation of lake sediment and rock sampling, prospecting and mapping designed to test the area for gold deposits in iron formation similar to the Cullaton Lake B zone, 250 km to the northeast.

Lake Sediment Geochemistry:

The majority of lakes sampled were of moderate depth (5 m), slightly acidic and clear (oligotrophic). Sediments were predominantly composed of a brownish-black, decomposed organic (gyttja) fraction (70-90%) and a greyish-brown clay-silt fraction (10-30%). Sediments were also characterized by restricted pH ranges (5.8-6.6) and were often encrusted with manganese and iron oxides. A total of 84 lake sediment samples were collected from two northeasterly trending magnetic highs. Trend A cuts the northwest corner of the permit area and trend B the southeast corner. Another 39

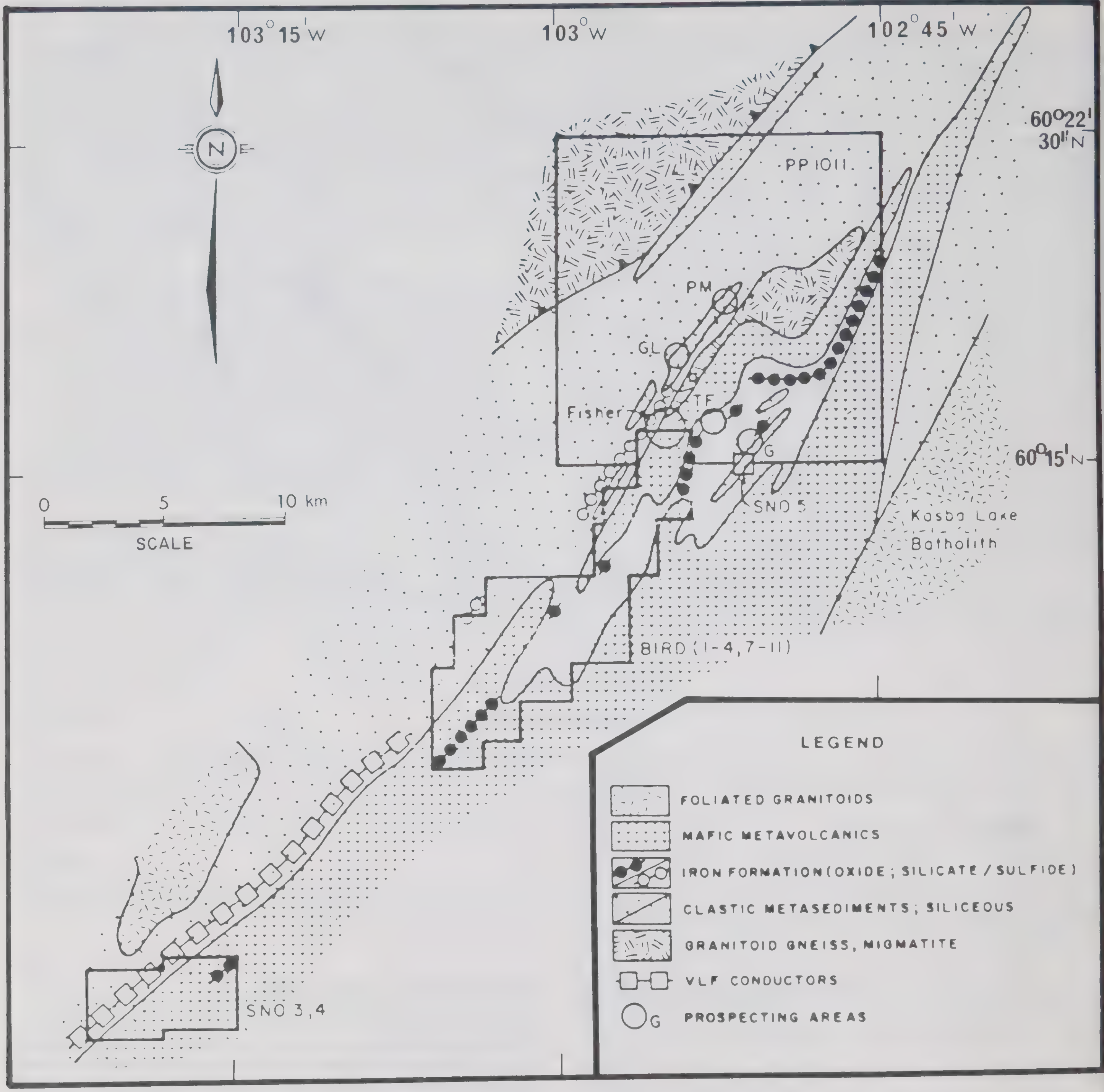

FIGURE 6-8: Geology of SNO and BIRD claims.

samples were collected along the sediment-volcanic contact, north of the permit area between Barr Lake and Latimer Lake. Silver contents are typically at the detection limit of 0.1 ppm and show little variability. Most (95%) of the gold assays are less than the threshold level of 5 ppb and do not correlate with arsenic content.

Trend A is characterized by spotty gold enrichment, trend B has significantly higher base metal concentrations but is relatively gold poor, and the northern contact exhibits only background levels of precious and base metals. None of these areas are considered favourable for precious or base metal prospects.

Geology:

Gold is associated with quartz stringers and sulphidation of magnetite in the wall rocks.

a) **TF** trend:

The TF trend is on a prominent linear magnetic high in the south-central part of Prospecting Permit 1011 (TF in Fig. 6-8).

It consists of scattered, deeply rusty weathering boulders of thinly bedded chert-magnetite iron formation and has been outlined along strike for a distance of 500 m. The boulders contain up to 20% disseminated pyrite in association with very thin conformable quartz stringers. Minor finely disseminated pyrrhotite is ubiquitous in meta-chert and meta-siltstone beds of the iron formation. This unit of oxide facies iron formation is traceable in subcrop over a stratigraphic interval of at least 25 m within a unit of siliceous metagreywacke.

The average gold content of 16 composite samples of boulders of iron sulphide-rich oxide meta-iron formation is 15 ppb. Notable assays include 625 ppb Au (sample 1151037), 80 ppb Au (sample 1151040) and 75 ppb Au (sample 1151039). Other assay results, greater than 100 ppb Au, obtained by Golden Rule Resources Ltd. from this vicinity, are reported to be from boulders of mafic metavolcanics.

b) **Gossan area:**

The gossan area is a few hundred meters north of SNO 5 claim (G in Fig. 6-8). Rusty weathering patches and horizons are easily visible from the air. Individual zones, up to 5 m wide and 50 m long, are found in a 30 m by 700 m area of mafic meta-volcanics along their contact with overlying meta-greywackes. Rusty weathering strata includes: foliated, dark green, medium- to coarse-grained, hornblende-plagioclase-quartz amphibolite and biotite-plagioclase-quartz-pyrite amphibolite (mafic tuffs); brown weathering: siliceous biotite-muscovite meta-greywacke and dark grey muscovite-graphite-quartz schist (meta-chert).

Rusty weathering areas consist of several percent disseminated pyrrhotite, lesser pyrite and trace chalcopyrite in association with very thin and conformable quartz-carbonate stringers. The average gold content of 17 grab samples from the zone is 40 ppb.

c) **PM ridge:**

Rusty weathering patches in mafic volcanics are on two northwesterly trending ridges near the center of Prospecting Permit 1011 (PM in Fig. 6-8). The rusty weathering zones are thin clastic metasedimentary units (muscovite-biotite meta-quartzwacke) ranging up to a metre in thickness and are intercalated with thinly-banded dark grey to brownish weathering metamorphosed mafic tuffs (medium- to fine-grained hornblende - actinolite - chlorite - plagioclase - quartz - pyrite amphibolite).

Rusty weathering patches are predominantly siliceous and contain up to several percent disseminated and fracture filled pyrite and pyrrhotite, lesser arsenopyrite and trace chalcopyrite associated with relatively thin (1-10 cm) conformable quartz carbonate stringers. Ten grab samples from the two ridges averaged 30 ppb Au. The best assays were from arsenopyrite-rich material.

d) **Gull trend:**

The Gull Lake trend (GL of Fig. 6-8) consists of rounded, scattered, deeply-weathered rusty boulders of amphibolite and pyrrhotite-quartz-chlorite rock interpreted as iron silicate and sulphide facies iron formation, respectively. The former contains up to 10% iron sulphides in association with conformable quartz stringers. Some quartz-rich boulders contained molybdenite. The trend has been traced along strike for 5 km.

Assays of 11 grab samples from quartz-rich boulders near "Gull Lake" is 30 ppb Au. Best results were 130 ppb, 100 ppb, and 152 ppb Au. Base metal accumulations, for all samples, averaged 1960 ppm Zn, 720 ppm Cu and 8 ppm Pb.

e) **Fisher showing:**

The Fisher showing is on an island, about 250 by 150 m in size, located on the northern boundary of the BIRD 1 claim in Bourassa Lake (Figure 6-8). Previous work, by Golden Rule Resources Ltd., established the presence of anomalous gold values in a train of pyritic, quartz-veined boulders of mafic tuff (up to 6000 ppb Au) and in associated soils (up to 55 ppb Au).

Follow-up work by Anaconda Canada Exploration Ltd. included rock sampling, mapping, prospecting and a magnetometer survey. Results of the magnetometer survey were generally flat and no discernable relationship between mineralized boulder fields and magnetic readings was observed. Although detailed prospecting failed to find bedrock, two types of boulders were recognized. Train 1, measuring 50 by 150 m and striking north by northeast (predominant glacial direction), consists of small angular boulders of dark grey to dark green, fine- to medium-grained hornblende-actinolite-quartz-pyrite amphibolite (mafic tuff). These boulders are rusty weathering, contain up to 10% coarse-grained pyrite as disseminations, and contain lesser chalcopyrite and sphalerite in association with 1-10 cm wide quartz-carbonate-tourmaline veins and stringers. The average gold content of 11 grab samples collected from this trend is 2650 ppb. The best results are 6140 and 4730 ppb Au (samples 1150021 and 1150028A, respectively). Base metal accumulations average 145 ppm Cu, 120 ppm Zn and 9 ppm Pb. Fourteen samples of grey weathering mafic tuff from boulders peripheral to train 1 returned gold values near the detection limit of 5 ppb.

SNOWBIRD GOLD PROJECT SNO 3 AND 4 CLAIMS

Golden Rule Resources Ltd.	Gold, Silver
150, 1300-8th Ave. S.W.	65 D/3
Calgary, Alta. T2R 1B2	60°03'N,103°18'W

REFERENCES

Gibbins (1984, 1985).
DIAND assessment report: 081853.

PROPERTY

SNO 3 and 4.

LOCATION

SNO 3 and 4 are 15 km south of the southwest corner at Atzinging Lake and 5 to 7 km north of the southern boundary of the Northwest Territories. The claims are 170 km northeast of the village of Stoney Rapids, Saskatchewan.

HISTORY

SNO 3 and 4 include a mineralized zone, referred to as the "N occurrence", discovered in 1971 and 1972 in Prospecting Permit 138 (Laporte, 1974b, p. 3- 4). Canadian Homestead Oils Ltd. had airborne EM, magnetic and radiometric surveys flown and contracted ground follow-up that led to the discovery of the N occurrence. The property was then option-

ed to Imperial Oil Ltd. who enlarged the grid and did geophysical and soil geochemical surveys. The soil geochemistry results were not encouraging, but none of the conductors were drill-tested.

In 1981 and 1983, Golden Rule Resources Ltd. prospected, sampled and restaked the "N occurrence" and surrounding area as part of their regional program.

DESCRIPTION

The SNO 3 and 4 claims straddle the main northeast-trending contact between mafic metavolcanics to the southeast and overlying metagreywackes to the northwest (Figure 6-8). Outcrop exposure is poor and the claims are within a burn area. Three airborne EM conductors strike across the main trend, and may represent fault or shear zones. They appear to be associated with brecciated graphite-bearing meta-quartzite.

Minor oxide-facies iron formation is intercalated with the mafic metavolcanics. Boulders of foliated granodiorite, probably related to the Kasba Lake Stock, cover the northern part of SNO 3.

CURRENT WORK AND RESULTS

Results from geochemical analysis of 16 lake sediment samples showed silver and several elements (U, Sr, Cd, Sb, Be and W) reflected detection limit levels. Gold content was below the regional threshold value of 5 ppb. Base metals showed apparently random spot highs. Zinc correlated well with iron and manganese as if it was involved in a scavenging process.

Boulder sampling, along the strike of a conductor that may be associated with the N occurrence, failed to give anomalous gold contents like material from the original showing.

The claims have been assigned a low priority for gold exploration.

SNOWBIRD GOLD PROJECT
SNO 1 AND 2 CLAIMS

Golden Rule Resources Ltd.	Gold, Silver
150, 1300-8th Ave. S.W.	65 D/16
Calgary, Alta. T2R 1B2	60°54'N,102°27'W

REFERENCES

Gibbins (1984, 1985); Shiller (1965).
DIAND assessment report: 081851.

PROPERTY

SNO 1 and 2.

LOCATION

The SNO 1 and 2 claims (60°54'N,102°27'W,) are 12 km east of the north end of Snowbird Lake (Figure 6-8).

HISTORY

The SNO 1 and 2 claims include a high-grade gold occurrence formerly staked and explored as the COP claims in 1969 and 1964. Schiller (1965, p. 14-16) reports the best assay was 169.3 g/t Au and 132.3 g/t Ag over a width of 0.5 m. Mineral rights to the area (65 D/16) were held by Gulf Minerals Canada Ltd. under Prospecting Permit 448 during 1977-1979 as part of their Ennadai Lake project (Laporte, 1981, p. 35-36), but little or no detailed prospecting or mapping was done on the permit area.

During a regional lake-sediment sampling program in 1981, Golden Rule Resources Ltd. revisited known mineral showings, found gold associated with late structures and quartz veining, and staked the SNO 1 and 2 claims (Gibbins, 1984, p. 279-280).

In 1983, detailed work on the SNO 1 and 2 claims resulted in the discovery of a fourth mineral showing, COP #4, in the north central part of SNO 1. It is similar to other showings and is related to a shear-vein system with varying amounts of quartz and various sulphide minerals. A number of outcrops of sulphide, magnetite and silicate facies iron formation were discovered in the vicinity of the claims, but significant gold assays were not encountered (Gibbins, 1985).

DESCRIPTION

The SNO 1 and 2 claims are underlain by a northerly trending (0-020°), narrow band of mafic metavolcanics about 3 km wide and flanked by foliated granitoids. Mafic metavolcanics consist of a sequence of flows, several tens of meters thick, characterized by a gneissic, dioritic-looking amphibolite basal unit, a foliated pillowed central interval, and a laminated amphibolite upper interval. The latter is associated with oxide facies meta-iron formation and/or disseminated iron sulphides that can be garnetiferous. Meta-iron formation is rusty weathering and typically less than a meter in thickness.

Volcanics dip shallowly (30°) to the east but local reversals in dip suggest broad folds, with steep west facing limbs, modified by northerly striking sub-vertical faults. Metavolcanics are cut by a prominent set of faults/joints oriented at 100° and associated with narrow quartz stringers several centrimetres wide.

CURRENT WORK AND RESULTS

In 1984, Anaconda Canada Exploration Ltd. geologists sampled rocks and boulders peripheral to known showings with negative results.

EAST ARM OF GREAT SLAVE LAKE (ATHAPUSCOW AULACOGEN)

Hoffman (1977) named the East Arm area the "Athapuscow Aulacogen", a "deformed east-northeast-trending basin, 270 km long by at most 80 km wide. It contains little metamorphosed early Proterozoic sedimentary and magmatic rocks exposed in and around the East Arm of Great Slave Lake".

In January, 1985, Highwood Resources Ltd. staked the HJL claims to cover a known nickel-cobalt showing on Blanchet Island (85 H/16), (Padgham and others 1978, p. 79-80). This was the only mineral industry activity in the East Arm in 1984 and 1985.

BLATCHFORD LAKE PLUTONIC COMPLEX

INTRODUCTION

The Blatchford Lake intrusive suite includes all the plutonic rocks of alkaline affinity that form a coherent complex known as the Blatchford Lake Plutonic Complex. It lies at the southern margin of the Slave Province and is bounded by Blatchford Lake on the north and Hearne Channel of Great Slave Lake on the south (Davidson, 1978). Geological mapping by Davidson (1972a, 1978) led to the recognition of several units that make up a multiphase, sub-circular ring complex some 23 km in diameter or 235 km² in area, that intrudes Archean plutonic rocks and metasediments of the Yellowknife Supergroup (Fig. 6-9).

The suite shows a remarkable range in composition that developed as the rocks crystallized during a sequence of intrusive events documented by field relationships (Davidson, 1972a, 1978). Successive units range from gabbro (with anorthosite inclusions) through leuco-ferrodiorite, quartz syenite and granite to peralkaline granite and syenite (Davidson, 1982).

It is convenient to consider the Blatchford Lake Complex in two parts: the earlier, western part including the Caribou Lake Gabbro, Whiteman Lake Quartz Syenite, Hearne Channel Granite and Mad Lake Granite, and the later, more extensive Grace Lake Granite with its Thor Lake Syenite core (Fig. 6-9). It is within the later peralkaline units that rare element minerals are found (Davidson, 1982).

Isotopic determinations indicate an early Aphebian age (2,150 Ma) for the Complex (Davidson, 1982). Bowring and others (1984) obtained U-Pb zircon ages of 2175 ± 7 Ma representing an older alkaline phase (Hearne Channel Granite) and 2094 ± 94 Ma from the younger peralkaline phase, the Thor Lake Syenite.

THOR PROJECT

Highwood Resources Ltd.	Be,Ta,Nb,REE,Y,CaF_2,
Suite 1600	U,Th,Zr
540, 5th Ave. S.W.	85 I/1,2
Calgary, Alta., T2P 0M2	62°07′N,112°35′W

REFERENCES

Davidson (1972a, 1978, 1982); de St. Jorre (1986); Gibbins (1981, 1983a,b, 1984, 1985); Grasty and Richardson (1972); Smith (1985); Smith and de St. Jorre (1985); Trueman (1984); Trueman and others (1984, 1986).

PROPERTY

THOR 1-45; NB 1-172; DISA 1-5 and REO 1-3.

LOCATION

The claims are centered on a small lake 105 km southeast of Yellowknife, known informally as Thor Lake, which is halfway between Blatchford Lake, 5 km to the north, and Hearne Channel of Great Slave Lake, 5 km to the south.

HISTORY

The area was staked as ODIN 1-4 in 1970 and uranium, thorium and rare earth elements were noted, but little work was done and the claims lapsed.

A government airborne radiometric survey flown in 1971 outlined a significant uranium and thorium anomaly (Grasty and Richardson, 1972). Dr. A. Davidson of the Geological Survey of Canada mapped and defined the Blatchford Lake Complex and its central core of Thor Lake Syenite in 1971 and 1977 (Davidson, 1972a, 1978).

During the fall of 1976, geologists of Highwood Resources Ltd. discovered a number of previously undiscovered mineral showings north of the original ODIN claims and staked the THOR 1-4 claims. Additional claims were added later when spectro-graphic analyses indicated quantities of niobium, yttrium and rare earth elements.

In 1977, Highwood Resources Ltd. did extensive prospecting, mapping, sampling and radiometric surveys including trenching in the T Zone and 335 m of diamond drilling in the S Zone (Gibbins, 1981). In 1978, 1091 m of drilling was done on the Lake and T Zones (Gibbins, 1983a).

In 1979, work was concentrated on the Lake Zone, where 5 trenches and 5 drill holes (136 m) were completed and sampled (Gibbins, 1983b, p. 174). Wayne Johnson of Target Exploration Services Ltd. mapped the southeast portion of the claims and did a soil radon survey over the Lake Zone in 1979. In September, a crew from the Saskatchewan Department of Mineral Resources did a lake-bottom radiometric, resistivity and bathymetric survey that defined a number of radiometric anomalies beneath the shallower parts of Thor Lake (Gibbins, 1983b).

In the spring of 1980, the claims were optioned to Placer Development Ltd., who drilled 18 holes (2000 m) mainly in the Lake Zone in 1980 and 1981 (Gibbins, 1984, Table 5-9 and Fig. 5-27, p. 277). The cores were logged, sampled, and measured for magnetic susceptibility and radioactivity. This work indicates three sub-horizontal mineralized layers, 10 to 45 m thick, within 100 m of the surface in the Lake Zone, containing 63 Mt of indicated and inferred material grading 0.03% tantalum and 0.4% niobium (columbium) with significant amounts of rare earth elements (samarium 0.1%, cerium 1%, lanthanum 0.6%) and zirconium 3.5% (Highwood Resources Ltd., Annual Report 1981). The T Zone contains 1.15 Mt of 0.55% Nb_2O_5 inferred with a further 5.5 to 7 Mt probable. Some 67,000 t of 1.5% Nb_2O_5 and 0.05% U_3O_8 are drill inferred in the S Zone, and an equal amount of similar grade is possible (Highwood Resources Ltd., Annual Report, 1980).

Other work done in 1980 included line-cutting, VLF-EM and radiometric surveys. New trenches were blasted south of the T and S Zones and all previous trenches were cleaned and resampled. Laboratory testing included petrographic, scanning electron microscope (SEM), lithogeochemical and bench tests to study the alteration, ore mineral composition and paragenesis to learn more about the geology and metallurgy of the deposit.

Placer Development Ltd. relinquished the option in the spring of 1982. Highwood Resources Ltd. resumed the role of operator, shipped a 4500 kg sample for metallurgical tests and did magnetometer and scintillometer surveys along the southern limits of the property.

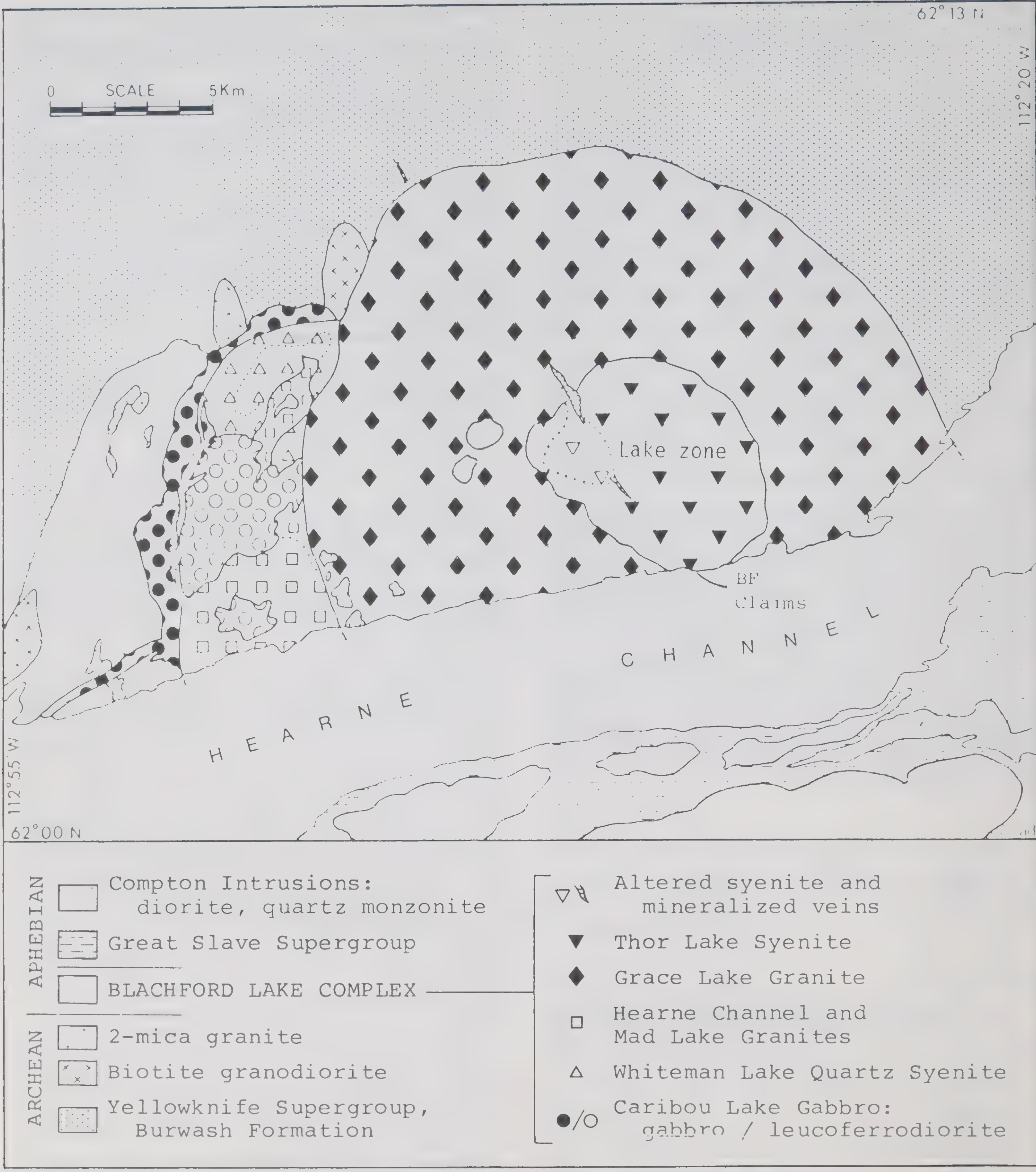

FIGURE 6-9: Geology of Blatchford Lake Complex (from Davidson, 1982).

T Zone:

Following the recognition of important beryllium potential in the T Zone in 1983, exploration work was directed mainly towards defining grades and tonnages of this element. Work included re-logging previous drill core from the T Zone, detailed geological mapping (Fig. 6-10), an orientation lithogeochemical survey to identify pathfinder elements, berylometer surveys of core and outcrops, stripping and trenching for bulk samples and a major drilling program from October 1983 to March 1984. The drilling outlined some 415,000 t of 1.0% BeO in the North T Zone and 1,180,000 t of 0.66% BeO in the South T Zone for a total of 1,595,000 t of 0.75% BeO to an approximate depth of 61 m (200 feet). A total of 4,174 m was drilled in 72 holes during the winter of 1983-84. Thirty-nine of these holes or 2,009 metres were drilled during 1983. The first two holes in the North T Zone intersected 21.3 m of 2.21% BeO, 3.0 m of 1.40% BeO, 21.6 m of 2.38% BeO, 4.6 m of 0.70% BeO and 12.2 m of 2.33% BeO. A 1,000 lb (456 kg) bulk sample from a pit in this area assayed 0.93% BeO over a length of 18.3 m. A second trench, 500 m south, assayed 1.61% BeO over a 19.8 m (65 foot) length. A total of 76 m³ (2,675 cubic feet) was removed by trenching (Gibbins, 1985 and Trueman and others, 1984).

Lake Zone:

A gravity survey of the Lake Zone was completed in the spring of 1983 to provide insight as to the attitude of the mineralized zones. Modelling of the resulting Bouger gravity anomaly suggests that the tantalum-niobium-rare earth zone extends downward in the form of an inverted cone for several hundreds of feet (Trueman, 1984).

Structural studies of ultra-mylonite observed in core and outcrop, as well as offsets of lithologies, have indicated several fault systems that help explain and confirm the form of the deposits.

Three holes (465 m) drilled in the Lake Zone in the spring of 1984 indicate a greater tonnage than the previously published reserve of 63 Mt probably exist at depth.

Metallurgical studies, based on oil-phase extraction techniques to recover very fine-grained tantalum-niobium minerals, continued during 1983 and 1984.

DESCRIPTION

The claims cover the central core of the Blatchford Lake Plutonic Complex known as the Thor Lake Syenite. Davidson (1978) mapped five distinct sub-units of the Thor Lake Syenite. A sixth unit of altered and poorly exposed syenite outcrops around and south of Thor Lake (the Lake Zone, Figs. 6-9, 6-10). It is altered by replacement of hornblende with fine aggregates of hematite, albite, fluorite and pale biotite. Davidson (1978) interpreted this as intense alteration of pre-existing syenites, possibly developed under the influence of a late-stage magmatic vapour phase related to, though probably slightly later than, the emplacement of pegmatites and acmite-albite veins to the east.

A zone of black rocks containing veins and irregular masses of pink to buff- coloured fluorite-albite, known as the T Zone, extends north-northwest of Thor Lake for 1250 m. It cuts through the outer syenite contact into the Grace Lake Granite. The F or Fluorite Zone may be a southern extension of this zone. Similar rocks are associated with narrow systems of syenite pegmatite and acmite-albite veins extending east-northeast from the southern exposed part of the T Zone, referred to as the R and S Zones. All of these zones contain Nb, Ta and REE mineralization, along with high concentrations of Na, Zr, F, Be and locally Y, Th and U (Davidson, 1982).

The Lake Zone, where Placer Development Ltd. concentrated their work, is a 2 km² triangular-shaped area of dark, altered and brecciated rock beneath and south of Thor Lake (Fig. 6-10). According to Placer Development Ltd. geologists, brecciation is the dominant feature of the core. Syenite and pegmatitic syenite have mortar texture, some specimens display a streaming of crystal and rock fragments and locally, there are rebrecciated breccias. "Extensive biotite flooding appears as a 'sea' of fine-grained, felty, matted biotite with crystal and rock fragment 'islands'. Zircon flooding is local and is marked by 30 to 50 percent zircon as crystal aggregates."

Petrographic work shows that the tantalum and columbium are present as columbo-tantalite in altered syenite. Bastnaesite, (a cerium-lanthanum fluoro-carbonate), allanite, perthitic feldspar, albite, fluorite, carbonate, green muscovite, biotite, and pseudomorphs after mafics and opaque minerals are also present. Columbo-tantalite occurs as discrete grains intergrown with magnetite or interstitial with zircon in matrix and biotite-flooded areas. The overall average grain size of elongate tantocolumbite is 20 by 2 μm with a range of less than 10 to 150 um long by 1 to 10 μm wide. Crystal aggregates are commonly 50 μm across, with a maximum range of 100 to 150 μm across.

Patterns of element depletion and enrichment throughout the differentiated suite are consistent with the hypothesis that the observed alteration and mineralization are the end-products of magmatic differentiation (Davidson, 1982).

The beryllium at Thor Lake is contained in the mineral phenacite, Be_2SiO_4, a colourless or white glassy mineral that is similar to and often confused with quartz. It normally contains 40-45% BeO by weight. Phenacite (also spelled phenakite), was first reported in altered Thor Lake Syenite by Davidson in 1978 (p. 126). Preliminary tests indicate that the grain size of the phenacite is amenable to its recovery by an established floatation technique (Trueman, 1984).

Although the beryllium zones are still not fully explored, the Thor Lake deposits appear to be the most significant beryllium deposits in Canada.

Beryllium is a rare-metal noted for its light weight (lighter than aluminum), high electrical resistivity, high thermal conductivity and heat capacity, high melting point, high strength to weight ratio, and high stiffness. By itself and in alloy form, beryllium finds wide use in electronic and aero-space applications. It is used in computers and peripherals, telephone and telecommunications, fibre-optics, aircraft struts and brakes, satellite frames, radar, and inertial navigation systems. Other applications include use in oil drilling and geophysical equipment, automatic transmissions, X-ray and CAT-scan equipment, nuclear moderators, and VHSIC computer chips.

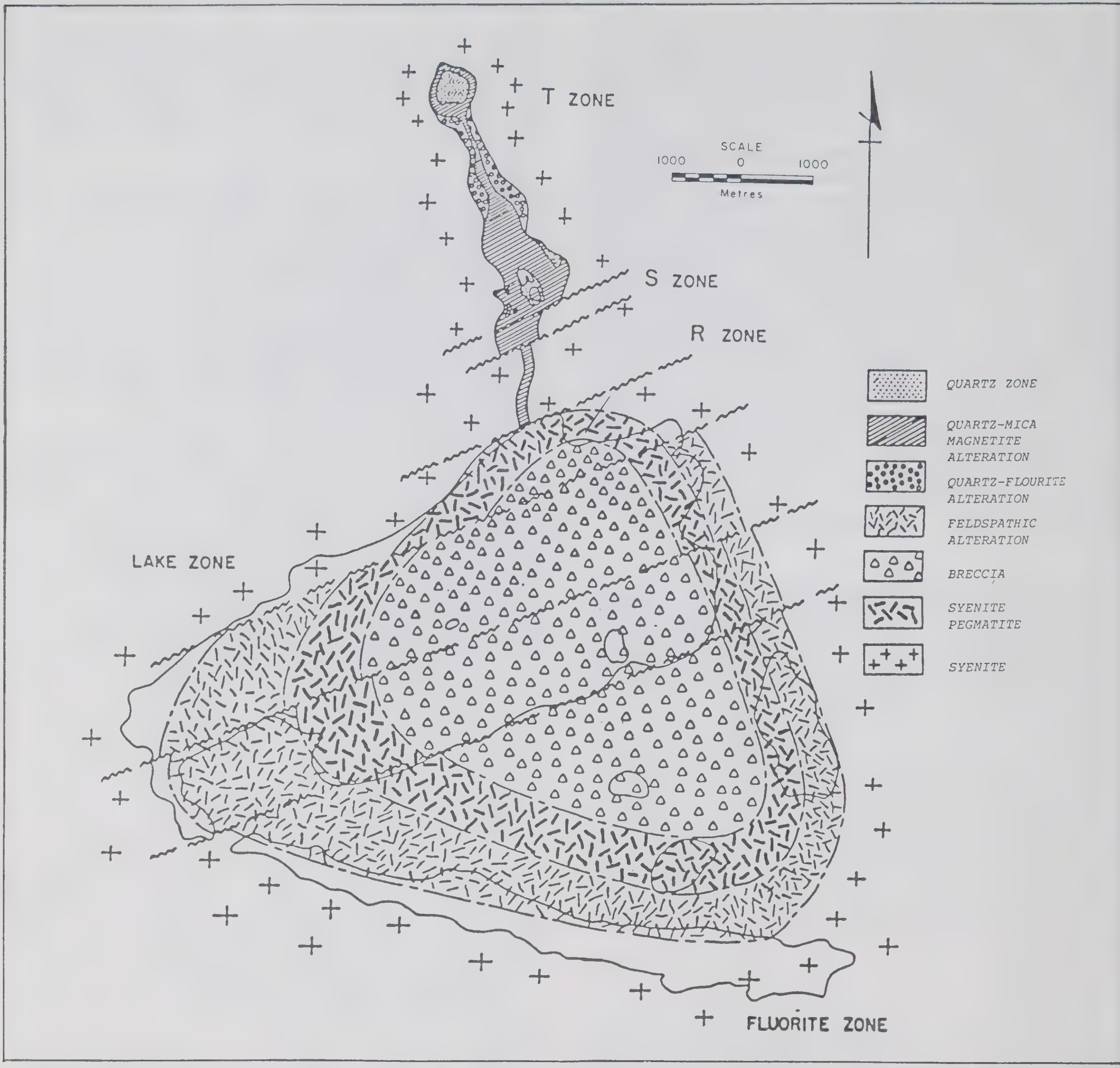

FIGURE 6-10: Distribution of rock types in the Thor Lake syenite altered core (from Highwood Resources Ltd.)

CURRENT WORK AND RESULTS

1984:

By the spring of 1984, over 100 drill holes in the T Zone had outlined two beryllium deposits, one of 434,550 t grading 1.4% BeO and another of 1,180,000 t of 0.66% BeO (Highwood Resources Ltd., Annual Report, 1984).

During the summer of 1984, geological mapping was completed on the T Zone and extended to cover the R, S, Lake and Fluorite Zones. This work was accompanied by removal of overburden, drilling and blasting to obtain surface samples for assay control and the delineation of the mineralized areas. Simultaneously, a sample was taken out of the high-grade beryllium zone at the north end of the T Zone, lifted by helicopter to a barge on Great Slave Lake, transported to Yellowknife and thence by truck to Witteck Development Inc. in Ontario. Other metallurgical work at the Alberta Research Council demonstrated the practicability of recovering fine-grained tantalum-niobium minerals.

In addition, selected samples were taken from the beryllium-zone drill cores for mineralogical studies of the yttrium and rare-earth minerals. A program of re-assaying these sections has established a significant reserve of these metals, both within and adjacent to the beryllium deposits.

These same sections in the T Zone were assayed for gadolinium, neodymium, and samarium as well as niobium and gallium. From this work, values have averaged 0.21% yttrium, over 1.0% niobium, 0.1% neodymium, 0.06% gadolinium, 0.12% samarium, 0.05% gallium and 0.9% cerium and lanthanum. Individual assays of core have run as high as 1.28% yttrium oxide and 4.75% niobium oxide over 3 m (10 feet) indicating a profound enrichment of these metals in the beryllium zones.

The Lake Zone was also drill tested in 1984. Although this work was not successful in isolating higher grade tantalum areas, it contributed to a revised estimate of tantalum resources in the Lake Zone to an inferred 181.5 Mt (Highwood Resources Ltd., Annual Report 1984).

Mineralogical studies of the deposits were begun at the University of Alberta and CANMET. About 120 km of ice road was built on Great Slave Lake between Yellowknife and Thor Lake, and some 500 t of mining equipment and supplies were moved to Thor Lake in preparation for the 1985 underground program.

Thirty-five holes (2,501.2 m) were drilled between January and March, 1984 and 21 holes (2,280.4 m) between September, 1984 and February, 1985. Most of these holes, now more than 100, were drilled in the T-Zone, but a few were in the Lake Zone.

1985:

Highlight of the 1985 work at Thor Lake was the underground program contracted to Strathcona Mineral Services Ltd. of Toronto. A 500 m long decline was driven to more than 80 m depth in the Be-Y-REE-rich north T Zone, primarily to provide a bulk sample of the various sub-zones for metallurgical testing, but also to verify and compare assay and berylometer results with drill results. A 90 t bulk sample of material mined in the beryllium zones was shipped to Lakefield Research Ltd. of Lakefield, Ontario by year end.

A total of 22 additional holes (1,822.5 m) were drilled in the deposits between September and early December of 1985.

Mineralogical studies were undertaken in the Geology Department, University of Alberta (Smith and de St. Jorre, 1985; Smith, 1985 and de St. Jorre, 1986). Specifically, the studies are concerned with the identification and nature of the various Y-, REE-, Nb- and Ga-bearing minerals present and their distribution within the beryllium deposits of the T-Zone and their sub-units (Figure 6-11). Of particular interest are the sizes, textural relationships and gangue mineral associations of these potentially economic minerals. Standard petrographic techniques and electron microprobe analysis are being done in conjunction with assay data used in this work.

By December, 1984, three Y-bearing minerals had been identified. Gadolinite $Y_2FeBe_2(Si0_4)_2O_2$, and xenotime $YP0_4$, appear to be the most abundant species. The third Y-bearing mineral is an unidentified Th, Fe, Y-silicate that is radioactive and may possibly be a new mineral species. Volatilization effects under the electron beam during microprobe analysis suggest that this mineral may be metamict and/or hydrous. All three Y-bearing minerals are found predominantly in the Lower Intermediate - Upper Intermediate Zones, although xenotime also occurs as inclusions in quartz in the Quartz zone.

The most abundant REE-bearing minerals are three LREE-enriched fluorocarbonates, tentatively identified as bastnaesite $Ce(C0_3)F$ and two of the three Ca-bearing phases: synchisite, parisite and roentgenite. These fluorocarbonates are found throughout the deposit in all four lithologic units. Monazite $(Ce,La,Y,Th)P0_4$, another LREE-enriched phase, is found in all rock types, excluding the Quartz zone. High La, Ce and Nd assays are attributed to the presence of one or more of these LREE-bearing minerals. High Gd assays are attributed to gadolinite and xenotime.

Concentrations of Nb minerals occur predominantly in the Wall zone and to a lesser extent in the Lower Intermediate zone. The principal Nb-bearing mineral in the T zone deposits is a Nb oxide, probably columbite $(Fe,Mn)Nb_20_6$ or ashanite $(Nb,Fe,Mn)_40_8$. A second Nb-bearing mineral, associated with Nb oxide in the Lower Intermediate zone, is an unidentified Nb,Ti,U-silicate. Tantalum, in these Nb-bearing phases, is present in trace amounts only.

Ga-bearing minerals are found exclusively in the albitized rocks of the Wall zone. Assay results indicate an average content of 500 ppm Ga in the Wall-zone rocks. The Ga occurs in albite laths where it is probably substituting for Al^{3+}.

Associated Be-bearing minerals are phenacite Be_2Si0_4, bertrandite $Be_4Si_20_7(OH)_2$, gadinolite(as mentioned above) and a member of the helvite group $(Mn,Fe,Zn)_4Be_3Si_3O_{12}S$ (Smith and de St. Jorre, 1985).

In 1985, the ion microprobe at Cambridge, England, was used to examine the elements hydrogen, lithium, beryllium and boron in some of these samples. This instrument permits the detection of light elements that either cannot be detected by the electron probe or can only be detected with difficulty, while at the same time offering a spatial resolution during analysis which approaches that of the electron probe. This work showed two varieties of zircon, which are intimately intergrown in a zonal manner. The lighter, less metamict zones have higher F, much higher Li, lower H and Be and much lower B than the darker grey more metamict zones. The metamict zones contain several percent U and Y.

Exploratory cathodoluminescence miscroscopy was also carried out at Cambridge. This shows considerable potential for revealing the modal amounts of cathodoluminescent minerals that are present, as well as for highlighting certain textural features (Smith, 1985).

In 1985, additional samples for mineralogical study were collected from the underground development in the T Zone. In addition, samples were collected from drill core of the Lake Zone, which was relogged during 1985.

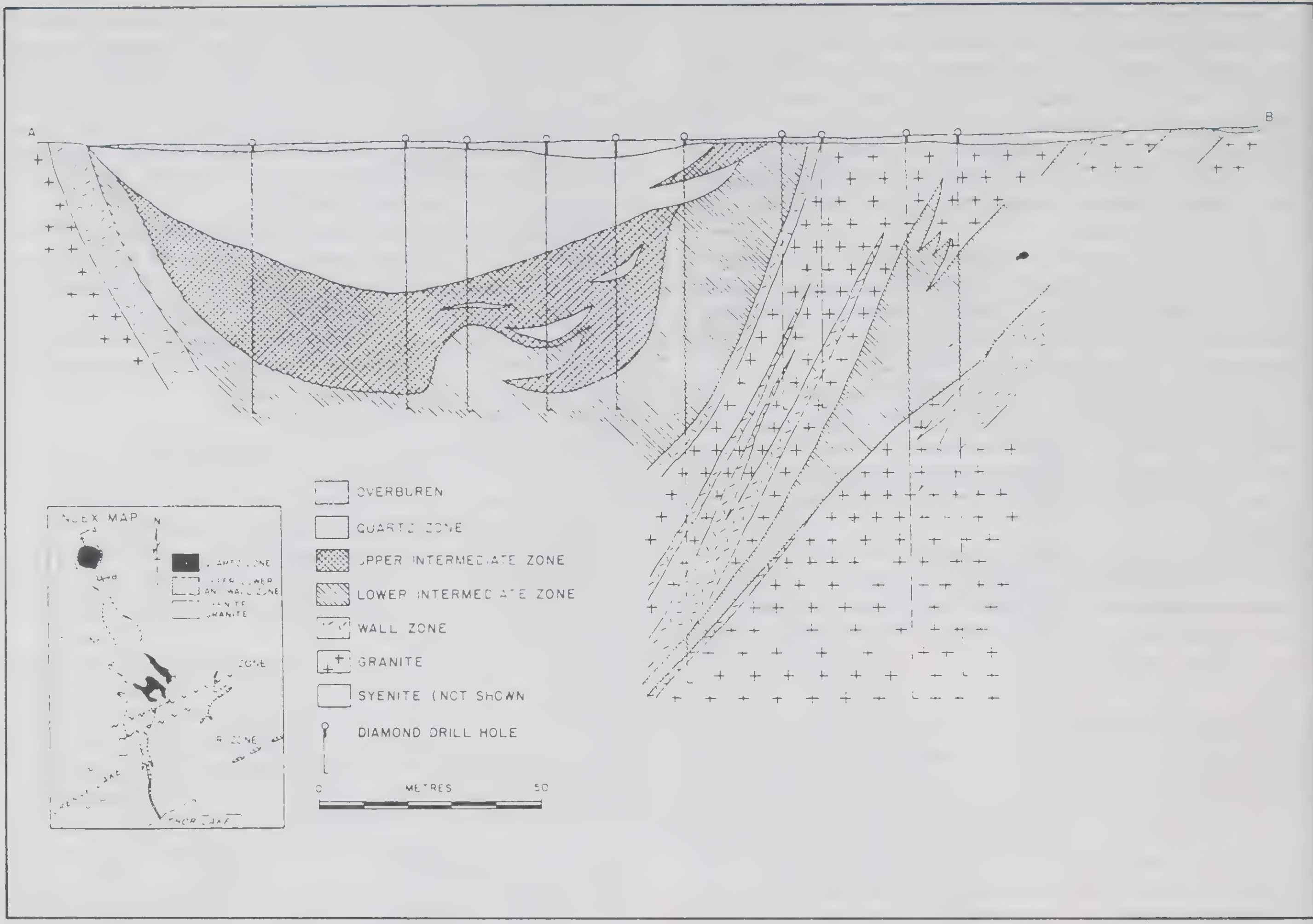

FIGURE 6-11: Longitudinal section (30+00E) showing the geology of the T-Zone beryllium deposit (from Trueman and others, 1984).

BF, TJO AND BEEF CLAIMS

The Big Fish Syndicate	REE, Nb, Y
3960 W 33 Ave.	85 I/1,2
Vancouver, B.C., V6N 2H8	62ºN,112º30'W

REFERENCES

Davidson (1978, 1982).
DIAND assessment report: 082038.

PROPERTY

BF 1-2, TJO, BEEF

LOCATION

The claims are adjacent to the southeastern corner of Highwood Resources Ltd.'s NB claims and include a discontinuous thin strip of the north shore of Hearne Channel, 1 to 8 km west of McKinley Point. Over 90% of the claim area is under the waters of Hearne Channel.

Hook Bay and Hook Point, both informal names are 2 km west of McKinley Point.

HISTORY

The BF 1 claim was recorded in September, 1981; BF 2 was recorded in October, 1983 and the TJO and BEEF claims in May, 1984.

In September, 1983, a reconnaissance rock geochemistry survey indicated potentially economic Ta and Nb results from peralkaline dykes at Hook Point on the BF 2 claim. Magnetometer and scintillometer surveys were undertaken at the same time, but significantly elevated readings were not encountered.

DESCRIPTION

The BF 1 claim includes the southernmost boundary of Thor Lake Syenite and the enclosing Grace Lake Granite (Fig. 6-9). It also contains the intersection of this contact with the north shore of the Hearne Channel and the southeasterly projection of a structural lineament that passes through Highwood Resources Ltd.'s T Zone and Fluorite Zone (Davidson, 1978, 1982). This southeast-trending lineament is clearly evident on the aeromagnetic maps (Geol. Surv. Can., Map 7190 G). Speculation suggests that this intersec-

tion may be the loci for the deposition of tantalum, tin and rare earth minerals similar to those found at Thor Lake or Mountain Pass, California. This concept is supported by black manganese staining similar to the T Zone on Highwood Resources Ltd. claims.

The BF 2 claim adjoins BF 1 to the west and contains three northeast-trending pegmatitic peralkaline dykes on the southeastern part of Hook Point.

CURRENT WORK AND RESULTS

In the fall of 1984, a four-person crew blasted and sampled three peralkaline dykes in the vicinity of Hook Point. Some 8.5 m^3 (300 ft^3) of trenching was done and about 45 kg (100 lb) of material was taken as samples. Rare earth elements, Nb, Zr and Y are all higher than background and concentratable to the 50,000 to 2,500,000 ppm (0.1 to 5 lb/ton) range. However, these results are not as high as a 1983 sample and below those necessary for economic exploration. Beryllium was not enriched in any of the samples. Several biogeochemical samples of various types of vegetation, collected at the mouth of several small drainage areas, did not reveal any anomalous enrichment of Be, Ta, Nb or REE.

THE GREAT SLAVE PLAIN

The Great Slave Plain is that part of the Interior Plains between latitudes 60ºN and 64ºN and between the Franklin Mountains and the western edge of the Precambrian Shield in the vicinity of Great Slave Lake. It is underlain mainly by Paleozoic carbonates, evaporites and shales. It has a relatively flat topographic surface, generally less than 300 m in elevation, that is characterized by sparse outcrop, abundant swamp, sink holes and karst topography. The Horn Plateau, which consists of Mesozoic strata, is a broad, smooth upland rising to 835 m in elevation.

The Great Slave Plain includes the Pine Point Lead-Zinc District (Fig. 6-12), the source of a large proportion of the Northwest Territories' annual production of minerals. Because of extensive over-burden, the flat-lying attitude of the host rocks and the nature of Pine Point type Pb-Zn deposits, exploration is mainly by IP surveys (Lajoie and Klein, 1979) and fence or grid drilling. Attempts to find deposits using rock and soil geochemistry, gravity and EM surveys have not been as cost effective. Most exploration work is done in the winter months when the widespread swamps and muskegs are frozen.

The geology and exploration philosophy has been discussed by several workers: Campbell, (1967), Skall (1975), Alldrick and others (1981), Rhodes and others (1984), Spencer and others (1980), Carter (1983), Krebs and Macqueen (1984), and Webb and Macqueen (1985). The geology of the area has been mapped and discussed by Douglas and Norris (1974) and Norris (1965).

Activities in the Pine Point Lead-Zinc District were severely affected by the 1982 economic recession and accompanying low metal prices. Pine Point Mines Ltd., the only producer in the region (see Chapter 2), shut down operations from January 2 to June 15, 1983. Mine production came from five operating and two developing pits in 1983 compared with eleven pits in 1982. About 900,000 t of ore was milled in the six and a half month operating period in 1983, compared to about 2,200,000 t for all of 1982.

Tabular ore zones were mined for the first time in 1981 and most of the 1982-83 production came from deposits of the North Trend (Alldrick and others, 1981; Rhodes and others, 1984).

Late in 1981, a large prismatic-type ore body (N-81) containing 0.9 Mt of high grade Pb-Zn, was discovered about

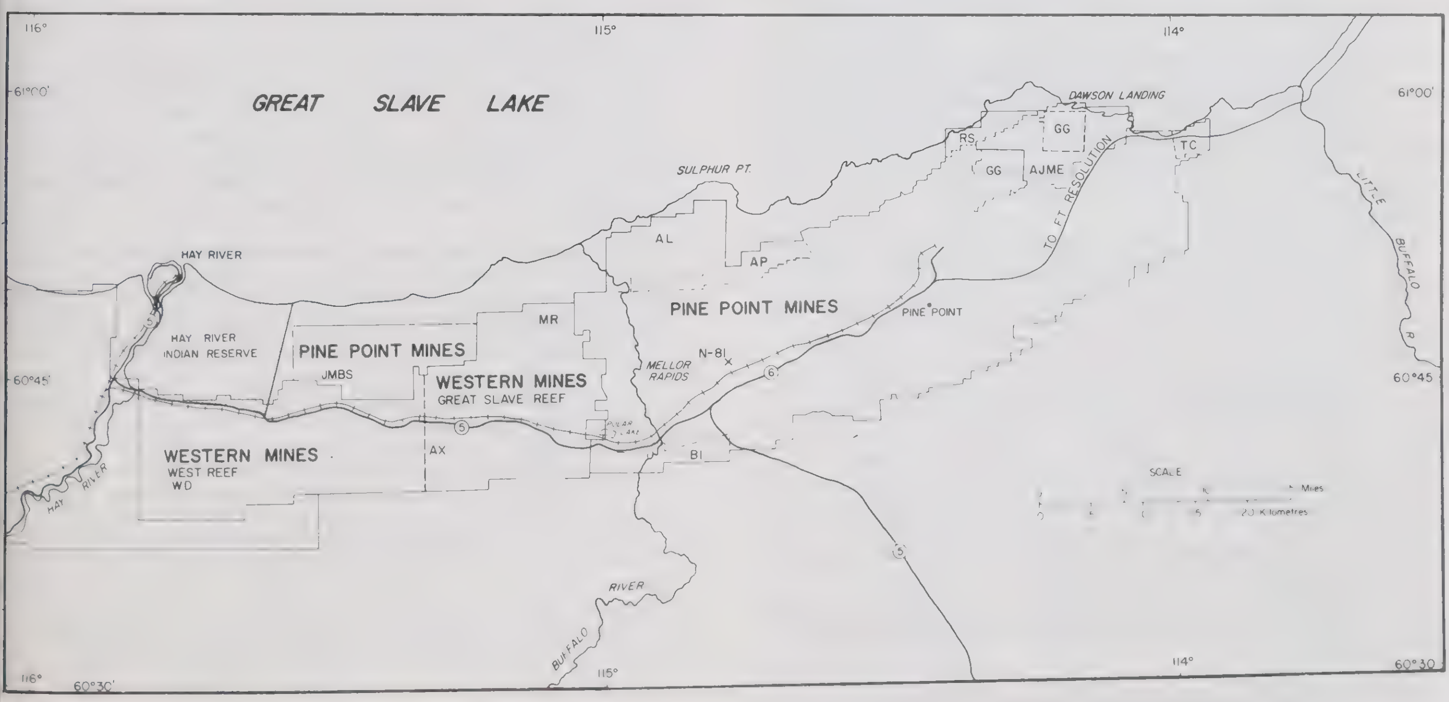

FIGURE 6-12: Claims in the Pine Point Lead-Zinc District.

20 km west-southwest of the concentrator along the Main Trend (Fig. 6-12). The 1982 exploration program confirmed the existence of 1.8 Mt of additional ore. The N-81 deposit contains a total of 2.7 Mt of ore grading 7% Pb and 14% Zn and is expected to become the most important production area over the next five years (Carter, 1984).

1984:

Exploration statistics are given in Table 6-4 for the years 1984 and 1985. However, most of this work is on mineral leases and the results are rarely reported as assessment work or to the public. When assessment work is required, it is not submitted in the form of comprehensive geological reports.

During 1984 and 1985, a few holes drilled on the north trend JMBS, AL, GG and AB claims (Fig. 6-12) and southern main trend BI claims were reported as assessment work. An IP survey was done on the RS claims in July, 1985.

Much of the 1984 exploration was along the Main Trend west of the N-81 deposit. One prismatic orebody was discovered 10.5 km west of the concentrator. It contains an estimated 200,000 t grading 8.1% Zn and 3.9% Pb. Closer spaced drilling in and around known orebodies on the North Trend resulted in a small increase in ore tonnage with some loss in zinc metal, (Pine Point Mines Ltd. annual report 1984).

1985:

Exploration expenditures in 1985 were $4.3 million. The combined geophysics and drilling programs were successful in adding nearly 2 Mt of ore grading 9.1% Zn and 4.6% Pb. The bulk of this ore was located in two tabular deposits on the North Trend, Z-60 and X-49; an underground deposit, X-71, also on the North Trend; and a prismatic deposit, P-24, on the East Main Trend. P- 24, scheduled for development in 1986, is a shallow, 500,000-ton deposit grading 7.6% Zn and 3.7% Pb.

TABLE 6-4 SUMMARY OF EXPLORATION ON PINE POINT LTD.'S MINERAL HOLDINGS

	1984	1985
Expenditure (millions of dollars)	3.7	4.3
Geophysics - IP (line-km)	350	740
Exploration drilling (m)	49,072	45,720
Ore outline drilling (m)	48,158	48,768

At the end of 1985, ore reserves calculated using long-term forecast prices were 15.8 million tons grading an average 6.7% Zn and 2.7% Pb, compared with 24.0 Mt grading an average of 6.7% Zn and 2.7% Pb at the end of 1984. Rising mining costs and forecasts of lower metal prices made it necessary to reassess the deposits included in the Company's ore reserves. A review included technical and long-term economic appraisals and resulted in the removal of 7.8 million tons of open pit material grading an average 4.7% Zn and 3.2% Pb from ore reserves (Pine Point Ltd. Annual Report 1985).

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CHAPTER 7
BEAR STRUCTURAL PROVINCE

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INTRODUCTION

The geology of the Bear Structural Province (Fig. 7-1) has been summarized in several previous Mineral Industry Reports (Seaton, 1978, 1981, 1983a, 1984; Seaton and Hurdle, 1978). In this report no attempt is made to summarize the geology beyond a statement of the geological subdivisions under which the properties have been grouped. Several Geological Survey of Canada and university thesis projects are in progress or have recently been completed covering parts of the Bear Province and it is anticipated that soon a drastically revised geological summary may be required.

The East Arm Subprovince, though geologically included with the Bear Province, is covered in Chapter 6 of this Mineral Industry Report.

References relating to individual property descriptions are listed separately in the appropriate sections. General information on the Bear Structural Province and detailed reports on mapping of specific areas of the Bear Province include those by: Allan and Cameron (1973); Badham (1972, 1976, 1978); Baragar and Donaldson, (1973); Campbell (1978, 1979); Campbell and Cecile (1975, 1976a,b,c, 1979); Cecile and Campbell (1977); Easton (1980); Fraser (1964, 1974); Fraser and others (1972); Gibb (1978); Grasty and Richardson (1972); Grotzinger (1982); Henderson, J.F. (1949); Hildebrand (1981, 1982); Hildebrand and others (1984); Hildebrand and Roots (1985); Hoffman (1973, 1977, 1978, 1980a,b); Hoffman and Bell (1975); Hoffman and Cecile (1974); Hoffman and Henderson (1972); Hoffman and McGlynn (1977); Hoffman and others (1970, 1977, 1978, 1980, 1984); Hoffman and Pelletier (1982); Kerans and others (1981); Kidd (1936); Kindle (1972); Lord (1941, 1942, 1951); Lord and Parsons (1952); Miller (1982); McGlynn (1957, 1974, 1975, 1976, 1977, 1980); McGlynn and Ross (1963); McGrath and Hildebrand (1984); Mursky (1963, 1973); Padgham and others (1974); Reichenbach (1985); Shegelski and Murphy (1972); Shegelski and Thorpe (1972); Smith (1962, 1967); St-Onge and Hoffman (1980); St-Onge and others (1984); Thompson and Ashton (1984); Thorpe (1970); Tirrul (1985); Tremblay (1971); Wilson and Lord (1942).

The three properties in the Bear Structural Province, explored in 1984-85 are underlain by rocks of the McTavish Supergroup which form part of the Wopmay Orogen, the subdivisions of which are listed below.

WOPMAY OROGEN

The Wopmay Orogen (Hoffman, 1981) comprises Aphebian sediments, volcanics and plutons to the east of Great Bear Lake. From east to west, the Wopmay Orogen includes the following (Fig. 7-1):

a) Epworth Group sediments of the autochthonous zone.

b) Epworth Group sediments and volcanics of the Asiak Fold and Thrust Belt.

c) Epworth and Akaitcho Group metasediments and metavolcanics of the Hepburn Metamorphic-Plutonic Belt.

d) The Great Bear Volcano-Plutonic Complex, which comprises mainly synvolcanic granitoid plutons and associated, largely subaerial, volcanics of the McTavish Supergroup. Parts of the complex are underlain by sediments and intrusive quartz porphyry or quartz-feldspar porphyry.

e) The Hottah Terrane, which consists of metamorphic rocks of uncertain, though probably Aphebian, age exposed in the Hottah Lake and Leith Peninsula areas.

DUMAS PROJECT

Central Electricity Generating	Uranium
Board Exploration (Canada) Ltd.	86 K/8,9
Suite 700, 635-8th Ave. S.W.	66°22'30''-66°45'N
Calgary, Alta., T2P 3M3	116°00-116°30'W

REFERENCES

Bowring (1982); Hildebrand (1984); Hoffman (1978, 1980, 1984); Seaton (1981, 1983a,b).

DIAND assessment reports: 080959, 081168, 081967.

PROPERTY

Prospecting Permits 1026-1030.

LOCATION

North Dumas Lake, in the central part of the Dumas Project area, is 460 km north-northwesterly of Yellowknife. Prospecting Permits 1026 and 1027 cover 86 K/8 NW and NE respectively, and Prospecting Permits 1028, 1029 and 1030 cover 86 K/9 NW, SW and SE respectively (Fig. 7-1). The Sloan River flows northwards through Gagne Lake and Dumas Lake on Prospecting Permit 1026, through North Dumas Lake on the boundary between Permits 1026 and 1029 and northwesterly through Prospecting Permit 1029.

HISTORY

The eastern margin of the Prospecting Permit 1030 area was previously explored by Hudson Bay Oil and Gas Company Ltd., which staked the PER claims in May 1977 and the HUD claims, which adjoined and lay east of the PER group, in December 1977. The properties were explored for uranium (Seaton 1981, 1983a,b and DIAND assessment reports 080959, 081168). Cominco also explored for uranium in the area south and west of Perrault Lake. In 1975, Cominco recorded the SLO and BURP claims, at and near the south end of Perrault Lake, and 25 DRY claims, roughly 10 km west of Perrault Lake.

During 1983 and 1984 Central Electricity Generating Board Exploration (Canada) Ltd. (CEGBE) and Uranerz Exploration

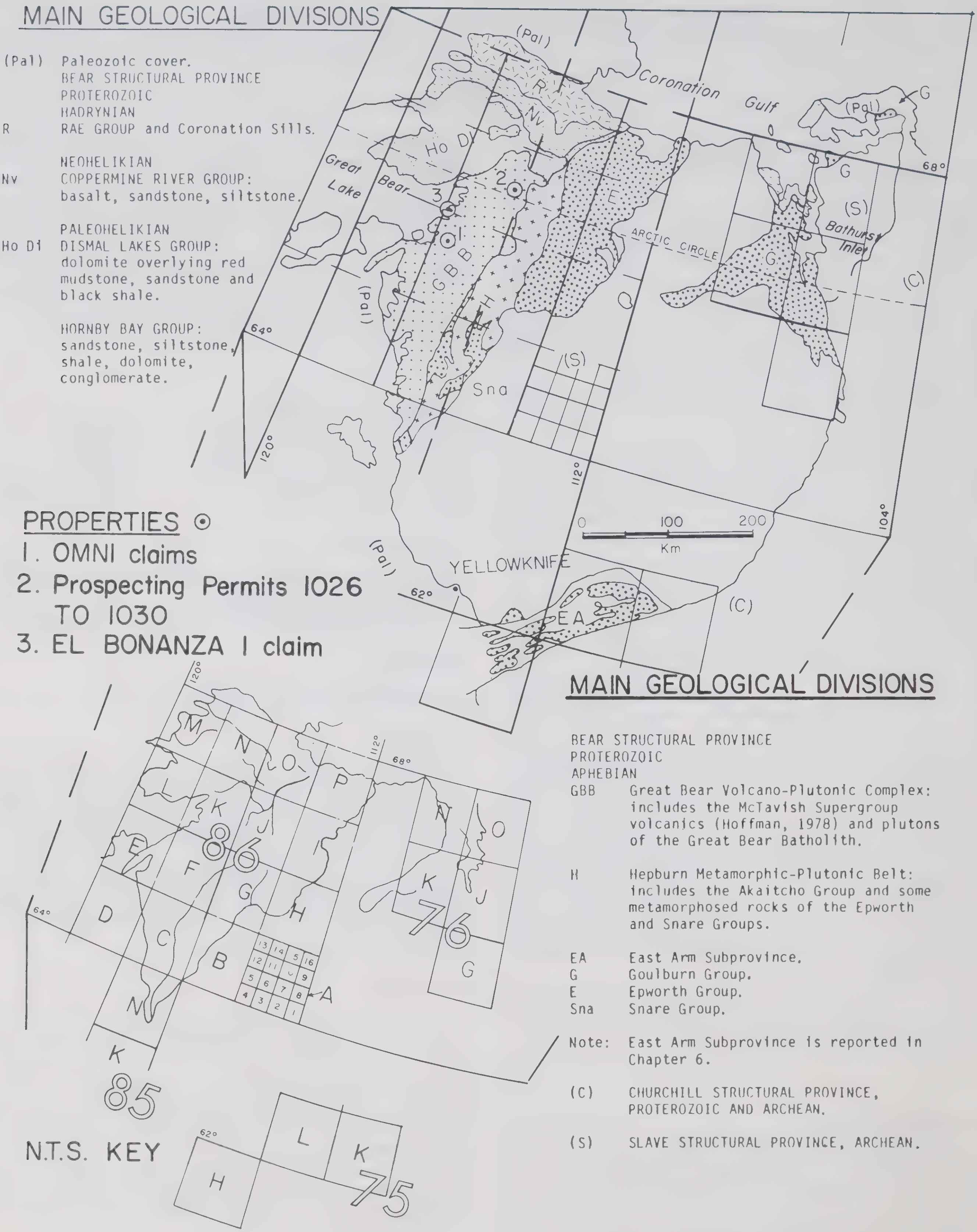


FIGURE 7-1: Geological divisions of the Bear Structural Province.

and Mining Ltd. (UEM) discovered radioactive showings during a regional reconnaissance program. UEM managed the project in 1983 and CEGBE was operator in 1984 and 1985. Prospecting Permits 1026-1030 were granted to CEGBE on February 1, 1985. Prospecting Permit 1028 was relinquished on February 1, 1986. The prospecting permits were explored in 1985 in joint venture with UEM.

LEGEND

QUATERNARY

Q — Glacial and other surficial deposits

PROTEROZOIC
HELIKIAN
HORNBY BAY GROUP

Quartz arenite, conglomerate and red beds of Big Bear Fluvial System

APHEBIAN
GREAT BEAR BATHOLITH

Medium-grained hornblende diorite and tonalite stocks (G4)*

Granite, adamellite, granodiorite units G2* and G3*. Includes from north to south: granites of the Spence Pluton, adamellites and granodiorites of the Kamut Pluton, granodiorites of the Junius Pluton, adamellites of the Adam Pluton

INTRUSIVE PORPHYRY

Gagne porphyry: megacrystic alkali-feldspar-quartz-plagioclase-oxybiotite porphyry forming laccoliths intrusive into mudstone of the Dumas Group (PG)*

McTAVISH VOLCANICS
DUMAS GROUP

Ignimbrites (Dri)*. Crystal-rich rhyolite-quartz latite

Basalt flows, in part strongly porphyritic (Db)*

Sediments, undivided:
Lacustrine mudstone-turbidite (Dm)*
Alluvial volcanic-lithic arenite (Ds)*
Alluvial volcanic-pebble conglomerate locally contains pebbles derived from east of Wopmay Line (Dc)*

*Units from Hoffman (1978)

WOPMAY LINE

The line is the trace of a surface separating McTavish Volcanics from Akaitcho Group metasedimentary and metavolcanic gneisses and granitic orthogneisses.

AKAITCHO GROUP

Metasedimentary, metavolcanic and granitic orthogneisses

DESCRIPTION

Most of the project area is underlain by volcanics and sediments of the Dumas Group of the McTavish Supergroup (Bowring, 1982; Hoffman, 1978, 1980, 1984). The eastern margin of the area is underlain by Archean granitoids and early Proterozoic granites of the Hepburn Intrusive Suite. A wedge of Helikian Hornby Bay Group sediments occupies a graben extending southward from Perrault Lake through most of Prospecting Permit 1030. The remainder of the area is underlain by granitoids of the Great Bear Intrusive Suite, which intrude the MacTavish Supergroup rocks.

The geology of the Dumas Project area with locations of various radiometric anomalies found by CEGBE is shown in Figure 7-2.

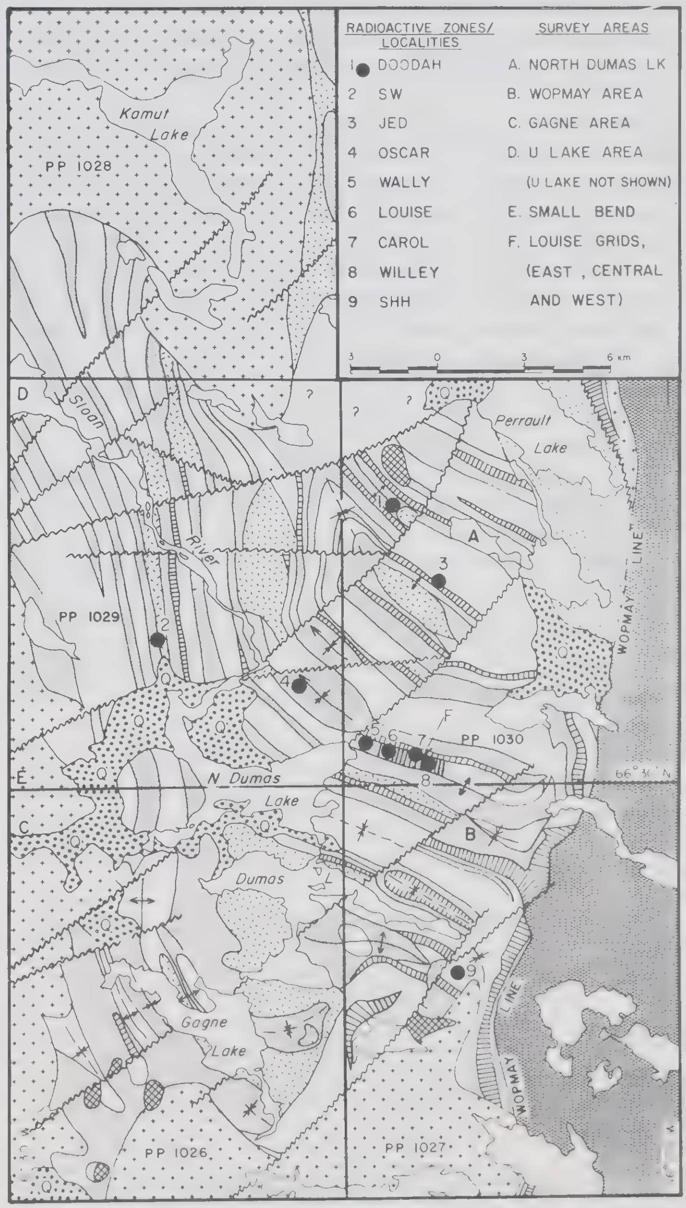


FIGURE 7-2: Geology of Prospecting Permits 1026-1030 (geology modified from Hoffman, 1978).

CURRENT WORK AND RESULTS

Reconnaissance geological mapping at 1:50,000 and prospecting were conducted over 86 K/8,9. Semi-detailed geological mapping at 1:10,000 and prospecting were done in the North Dumas area, the Wopmay area, the Gagne area, the U Lake area and the Small Bend area. Detailed surveys explored the Louise area where a highly radioactive uranium-, silver-, cobalt-, nickel- and copper-bearing boulder was found in 1984 on ground now covered by the Louise West grid. The adjoining Louise West, Central and East grids were geologically mapped at 1:1000 and prospected, and the Louise West and Central grids were soil sampled. Soil samples were analyzed for uranium, copper, nickel and cobalt. Five trenches were excavated on showings in the Louise Grid area. Showings trenched were the Willey East, Willey Central and nearby W-2, in the east central part, the Willey West in the central part of the Louise Central Grid, and the Carol stratabound native copper showing on the eastern margin of the Louise West Grid.

At the Willey Central trench where strong radioactivity was noted pitchblende is confined to a narrow zone in conglomerate. Low grade copper and silver assays were obtained across 3 m of conglomerate and grit which is flanked by mudstone. Copper minerals include chalcopyrite, bornite and malachite. The W-2 trench also covers a narrow (less than 1 m thick) unit of conglomerate flanked by mudstone: the conglomerate contains less than 1% copper. The Willey West trench is apparently excavated in the same unit of conglomerate as the Willey Central trench. Sampling revealed weak concentrations of uranium, copper and silver in the conglomerate.

The source of the Louise radioactive boulder was inferred to be in a gabbroic body to its east. No other radioactive boulders were found.

Thin sections of ten rock samples were petrographically examined.

OMNI CLAIMS

Echo Bay Mines Ltd.	Gold
3300 Manulife Place	86 F/12
10180 - 101st St.	65°40′N,116°50′W
Edmonton, Alta., T5J 3S4	

REFERENCES

Hildebrand (1984); Hoffman and others (1976); Seaton (1983b).

DIAND assessment report: 081825.

PROPERTY

OMNI 1-5.

LOCATION

The claims (Fig. 7-1) are between Balachey Lake and Ghosty Lake, and 390 km north-northwesterly of Yellowknife.

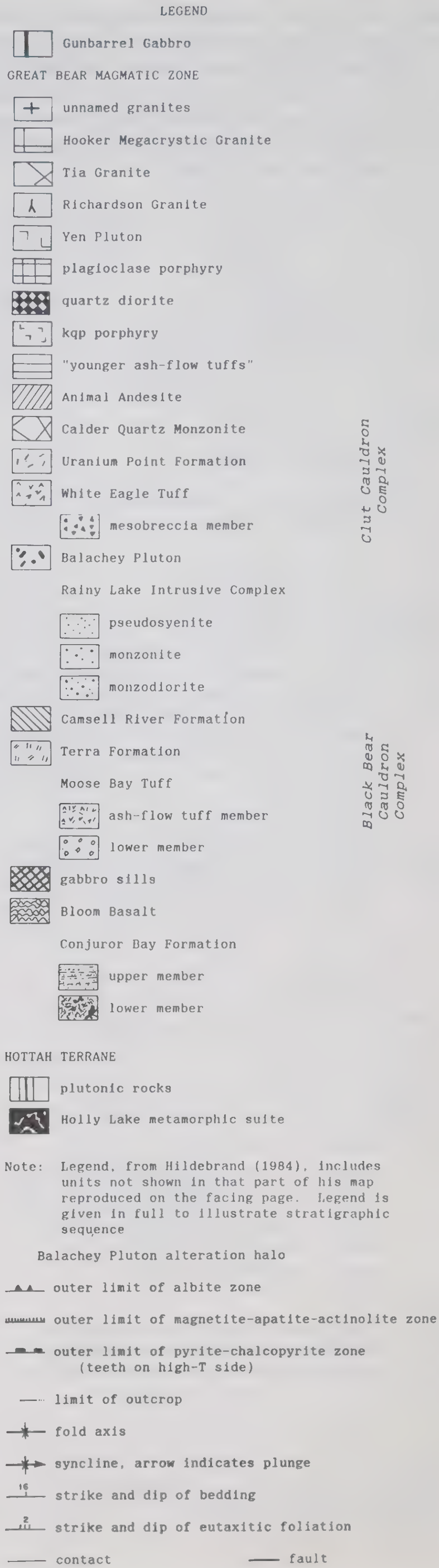


FIGURE 7-3: Regional geology of the OMNI claims (geology from Hildebrand, 1984).

HISTORY

The history to 1979 has been summarized by Seaton (1983b). The claims are owned by Highwood Resources Ltd., which staked OMNI 1 in 1978 and acquired OMNI 2-5 in 1979. Echo Bay Mines Ltd. examined the property in 1984.

DESCRIPTION

The OMNI claims are mainly underlain by the White Eagle Tuff of the Clut Cauldron Complex of the upper Labine Group (Hildebrand, 1984). The regional geology is shown in Figure 7-3. Hildebrand describes the White Eagle Tuff as 'a densely welded ash-flow sheet and associated breccias'. Smaller areas in the western part of the property are underlain by the Uranium Point Formation and Animal Andesite which outline and fill the trough of a northwesterly plunging syncline.

CURRENT WORK AND RESULTS

In 1984, trenches in the northern part of OMNI 1 were sampled and the pre-1984 grid was extended southwards on OMNI 2 (Fig. 7-4).

A VLF-EM survey covered 7.8 line km in the southern part of the grid. Major conductors were not found.

Soil samples collected from the grid extension were analyzed for gold and for 30 elements (ICP analysis). Eleven rock samples were collected and assayed for gold and silver.

A quartz-veined and chalcopyrite-, pyrite- and hematite-bearing zone in andesitic tuffs, breccias and flows was noted to be as much as 8 m wide. Some of the samples from this zone assayed as much as 5 g/t Au and 70 g/t Ag.

The geochemical survey outlined a linear zinc anomaly spatially associated with a chalcopyrite - pyrite - hematite - bearing boulder.

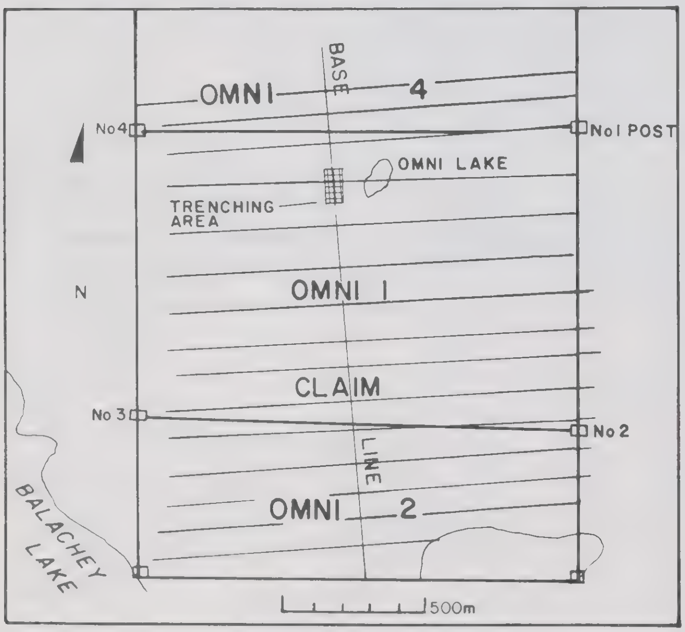


FIGURE 7-4: Grid and trenching area on the OMNI claims.

EL BONANZA 1

Hugh Arden
7 Bromley Dr.
Yellowknife, NWT, X1A 2X8

Silver
86 L/1
66°01'N,118°06'W

REFERENCES

Hildebrand (1981); Hoffman (1984); Kidd (1933); Lang (1952); McGlynn (1971); Mursky (1973); Thorpe (1972).
DIAND assessment reports: 019169, 061014, 061573 081869.

PROPERTY

EL BONANZA 1.

LOCATION

The property is near Mile Lake, 440 km northwesterly of Yellowknife and 8 km south of Port Radium (Fig. 7-1).

HISTORY

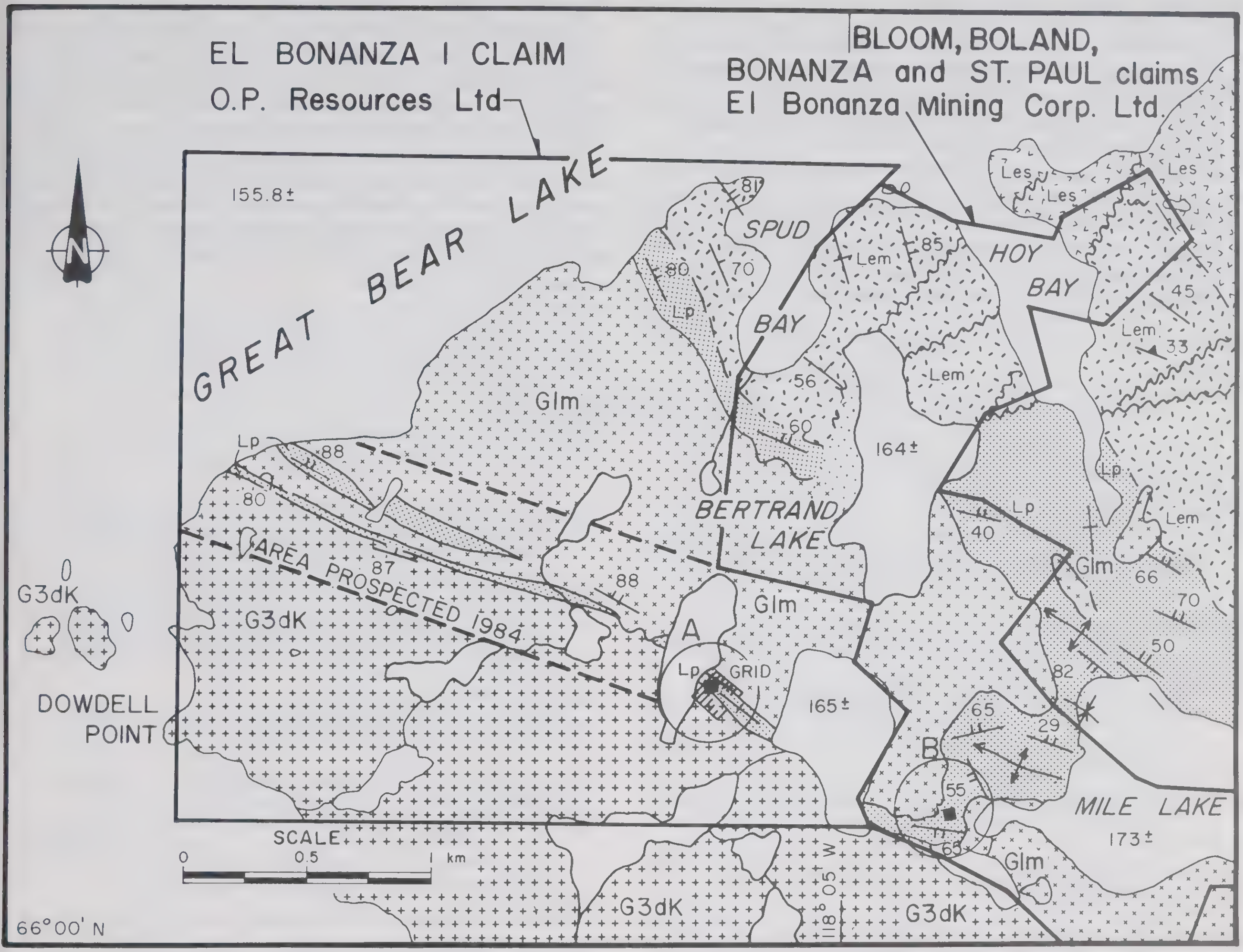
The El Bonanza silver showings were discovered in 1931 by E.C. St. Paul and were staked by G.A. Labine, and E.C. St. Paul and Associates for Eldorado Gold Mines Ltd. The original claim block covered the El Bonanza East showing and the El Bonanza West showing which now lies within EL BONANZA 1. The El Bonanza East showing is on BONANZA 7, part of a claim group held by El Bonanza Mining Corporation Ltd. who acquired an interest in the eastern part of the original claim block in 1934.

Eldorado Gold Mines Ltd. excavated 17 trenches along a 100 m long, northwesterly trending chloritic zone at the El Bonanza West showing in 1933. A shaft was sunk in the middle part of this zone, in 1938, and roughly 90 m of lateral work were completed at the 30 m (100 ft) level. No more work was done. In 1943, Eldorado Gold Mines Ltd. changed its name to Eldorado Mining and Refining Ltd., and concentrated its effort on uranium mining. Claims covering the El Bonanza West showing lapsed. EL BONANZA 1 was recorded by Hugh Arden in June 1982, who later optioned the claim to O.P. Resources Ltd, in August 1984. O.P. Resources dropped the option in September 1985 and the claim reverted back to Hugh Arden.

A more comprehensive history of the El Bonanza East and West showings can be obtained in Kidd (1933), Lang (1952), McGlynn (1971), Thorpe (1972) and in DIAND assessment reports 019169, 061014 and 061573.

DESCRIPTION

The geology of the property is shown in Figure 7-5. EL BONANZA 1 is largely underlain by two bodies of granitoid rocks: the Mystery Island Intrusive Suite in the central, northwestern and southeastern part of the claim and the Dowdell Pluton in the southwestern part. Between the two granitoid bodies and marginal to the Mystery Island Intrusive Suite within the EL BONANZA 1 claim area is a thin unit of mainly sandstone and siltstone of the Port Radium Formation. This sedimentary unit lies within the alteration halo of the Mystery Island Intrusive Suite rocks, and hosts the El Bonanza East and the El Bonanza West silver showings (Figure 7-4).



EARLY PROTEROZOIC

GREAT BEAR BATHOLITH

G3dk Coarse grained biotite-hornblende (chlorite-epidote) syenogranite(k), G3d, Dowdell pluton

Glm MYSTERY ISLAND INTRUSIVE SUITE: medium grained diorite, quartz monozonite, quartz syenite and granodiorite; semiconcordant sheets; wide alteration haloes, comprising an inner bleached and albitized zone, a central zone of actinolite-apatite-magnetite pods, breccias, veins and replacement, an outer zone of chalcopyrite gossan; important polymetallic ore veins occur within the alteration haloes; at least one intrusion of this suite is demonstrably contemporaneous with LaBine Group volcanism

McTAVISH SUPERGROUP

Les SURPRISE LAKE MEMBER: porphyritic hornblende-augite-plagioclase andesite flows and breccia; many flows trachytic; some flows oxidized to a brick-red colour; includes thin sedimentary interbeds.

Lem MILE LAKE MEMBER: porphyritic andesite flows interbedded with volcanogenic sandstone and conglomerate, andesitic lapilli tuff and ashstone

Lp PORT RADIUM FORMATION: thin bedded, fine grained sandstone and siltstone with at lease two carbonate interbeds less than 1 m thick; all exposures lie within alteration haloes of the Mystery Island Intrusive Suite

SYMBOLS

A El Bonanza West Showing area.

B El Bonanza East Showing area.

Showings and shafts are roughly at centres of circles

Geological boundary (defined, approximate)

Bedding, tops known (inclined, overturned)

Bedding, tops unknown (inclined, vertical)

Flow banding (inclined, vertical)

Fault (defined, approximate)

Anticline, arrow indicates plunge (defined, approximate)

Syncline (approximate)

FIGURE 7-5: Geology of El Bonanza 1 and adjoining property (geology modified after Hildebrand, 1982).

CURRENT WORK AND RESULTS

A grid with a 150 m northwesterly base line and 100 m winglines was constructed. The El Bonanza West showing and shaft is in the north-central part of the grid.

The grid was explored by 1:500 geological mapping, and by magnetometer and VLF-EM surveys.

Mapping revealed a zone of chloritic alteration roughly coincident with the trenched zone to the northwest, southeast of the El Bonanza West shaft. This chloritic zone includes narrower and shorter zones of carbonate veining. Sediments between the chloritic zone and the medium grained monzonite and diorite of the Mystery Island Intrusive Suite have been altered from their normal grey colour to salmon pink.

The chloritic zone coincides with a magnetic high and a VLF-EM conductor. A second VLF-EM conductor farther to the southwest and subparallel to the Dowdell Plutonic Suite granite contact crosses an overburden-covered area for much of its length and is not coincident with any magnetic high.

A 3 by 0.6 km area along the screen of Port Radium Formation Sediments was prospected. No silver showings were found. At the El Bonanza West showing dendritic silver was noted to be associated with a small amount of cobalt-nickel arsenides and generally to be concentrated in areas of more intense chloritic alteration.

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CHAPTER EIGHT
SLAVE STRUCTURAL PROVINCE

J.B. Seaton, Bear-Slave District Geologist
J.A. Brophy, Cordilleran District Geologist
J.C. Crux, Geologist

INTRODUCTION

This introductory section to the Slave Structural Province is essentially the same as that in the 1977, 1978, 1979, 1980-81, and 1982-83 Mineral Industry Reports, but has some modifications in the list of subdivisions under which properties are discussed.

About two-thirds of the Slave Structural Province is made up of sediments and volcanics of the Archean Yellowknife Supergroup that have been metamorphosed under greenschist to upper amphibolite grade conditions (Frith, 1978; Neilsen, 1978; Percival, 1979; Thompson, 1978). The supracrustal rocks, of which about 15% are volcanics, are exposed in sinuous and anastamosing belts locally wrapped around basement gneisses and commonly flanked, separated or interrupted by quartz diorite, quartz monzonite, granodiorite and granite intrusions. Relatively narrow volcanic belts containing various proportions of mafic, intermediate and felsic components are commonly flanked on one, rarely on both, sides by metasediments. The metasediments are predominantly greywacke, commonly interbedded with thinner pelitic layers with phyllitic or slaty cleavage. Topographically recessive phyllite may overlie and flank the volcanics or may be found locally within the volcanic sequence.

Contact relations of granitoid plutons with surrounding supracrustal rocks are generally concordant (Henderson, 1976), although crosscutting granodiorites, quartz monzonites and associated pegmatites have been mapped. Locally the plutons are bordered by migmatite. Contact metamorphic aureoles may be extensive or practically absent.

Economic mineral discoveries have been mainly in the volcanics, and consequently these rocks have been more intensely studied. Most of the volcanic belts have been covered - in many cases more than once - by airborne magnetic and EM surveys which have outlined numerous conductors mostly related to graphitic volcanogenic sediments or extensive zones of disseminated sulphides.

The extent of pre-Yellowknife Supergroup basement is still speculative and will remain so until more geochronological studies and detailed mapping have been done. Locally, plutonic gneisses and massive rocks of tonalitic composition unconformably underlie supracrustal rocks of the Yellowknife Supergroup, as at Point Lake (Baragar and McGlynn, 1976; Henderson, 1977; Henderson and Easton, 1977). Commonly the basal contact of the Yellowknife Supergroup has been obliterated by granitic intrusions. Broad zones of granitic gneiss, migmatite and mixed gneisses, including or derived from Yellowknife Supergroup rocks (unit An of McGlynn, 1977), may include basement that is so far unrecognized. Some tonalitic clasts in the Yellowknife Supergroup sediments may be derived from unroofed syntectonic plutons.

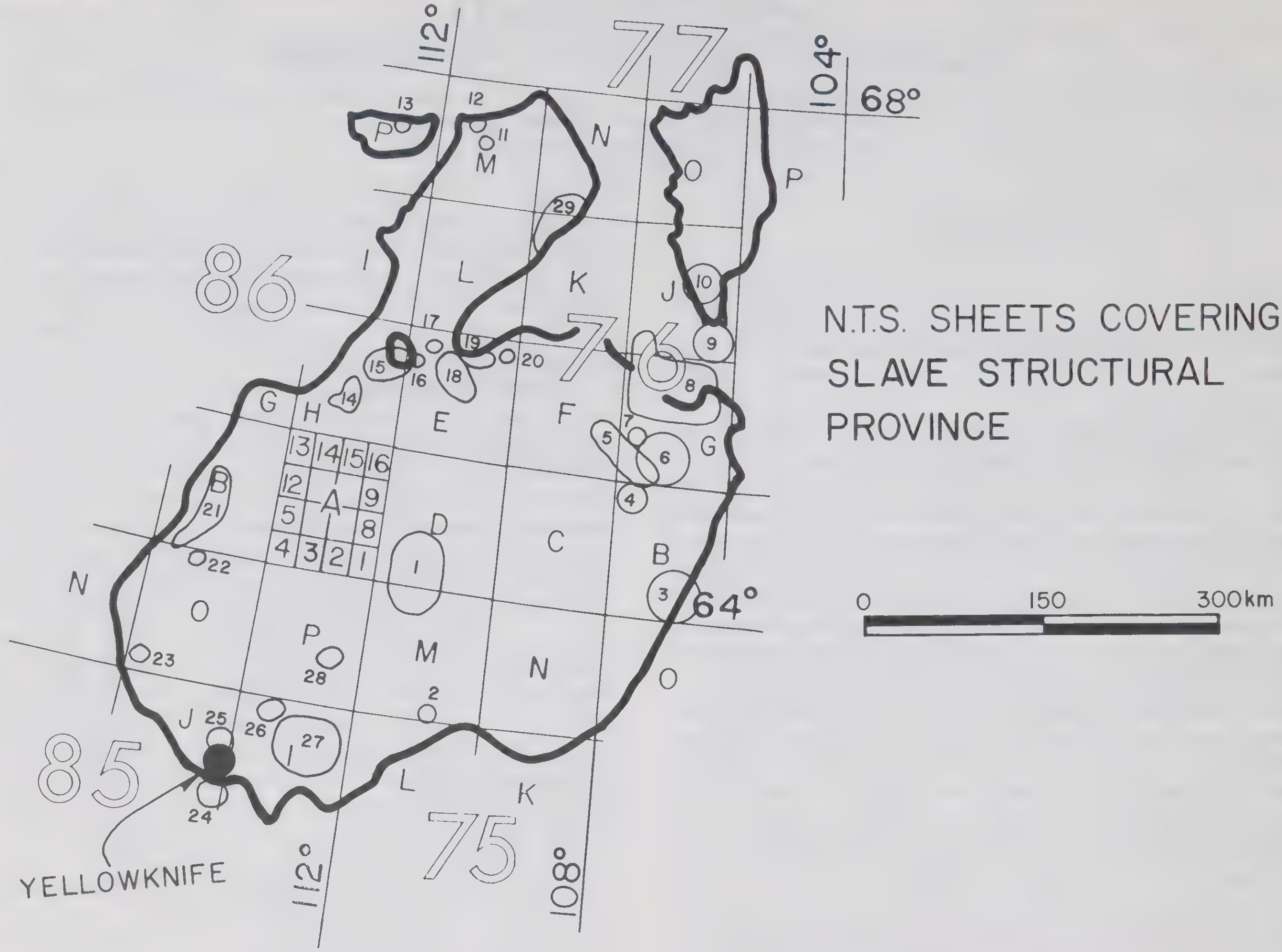
Volcanic belts may comprise more than one cycle of volcanism, as do the Back River Volcanic Complex and the Courageous Lake-McKay Lake Volcanic Belt. Distally, the volcanics, in most cases, interfinger with the sediments that fill the greater part of the basins. Iron formations within the sediments may be distal products of volcanism. The sediments clearly show complex folding, whereas in the more competent volcanics the effect of such folding is obscure.

Selected references relating to specific parts of the Slave Province or to individual properties are listed in the appropriate sub-sections. Some general references on the Slave Province and some which, by their nature, do not lend themselves to inclusion in property sub-sections (for example; regional, structural, geochemical or airborne radiometric surveys by the Geological Survey of Canada) include: Allan and Cameron (1973); Allan, Cameron and Durham (1973a,b,c); Baragar and McGlynn (1976); Cameron (1980); Darnley (1973); Darnley and Grasty (1972); Frith (1980a,b, 1981a,b); Frith and Roscoe (1980); Fyson (1980, 1981, 1982); Fyson and Frith (1979); Henderson (1972, 1975a,b, 1976, 1978, 1981); Henderson and Macfie (1985, 1986); Henderson and Thompson (1980); James (1985, 1986); King (1982); Lambert (1977); Meintzer and others (1984); Lord (1941, 1942); McGlynn (1977); McGlynn and Henderson (1970, 1972); Richardson and others (1973, 1974); Ross (1966); Stockwell (1933); Thompson (1978); and Thompson and others (1985, 1986).

In this chapter, properties are grouped under 11 headings, indicative of common geological - in a few cases, geographical - settings (Fig.8-1). These headings are:

1. Courageous Lake-MacKay Lake Volcanic Belt;
2. Indian Mountain Lake-Benjamin Lake Supracrustal Belt;
3. Healey Lake-Regan Lake Supracrustal Belts;
4. Beechey Lake Basin;
5. Bathurst Inlet, Southeast (Western River-Gordon Bay area);
6. Wilberforce Basin
7. High Lake and Anialik Supracrustal Belt;
8. Eokuk Inlier;
9. Point Lake-Itchen Lake-Contwoyto Lake Metasedimentary Belt and Lupin Mine Area;
10. Russell Lake-Indin Lake Supracrustal Belt;
11. Yellowknife Supracrustal Basin.

The distinction between volcanic belts and supracrustal belts is arbitrary, in that most volcanic belts include variable amounts of metasediments. Moreover, volcanic belts are separated from one another by granitoid intrusions, by basement or possible basement to the Yellowknife Supergroup, and by metasediments. Hence volcano-sedimentary belts (supracrustal belts) are themselves joined by sediments making precise delineation of individual supracrustal belts rarely possible. The term 'supracrustal belt' is used in this report to describe a volcanic belt containing numerous sedimentary units that by volume are an important component of the belt. For convenience some properties underlain



1	COURAGEOUS LAKE - MACKAY LAKE VOLCANIC BELT Figures 8-2 to 8-5
2	INDIAN MOUNTAIN LAKE - BENJAMIN LAKE SUPRACRUSTAL BELT Figure 8-6
3 to 5	HEALEY LAKE - REGAN LAKE SUPRACRUSTAL BELTS Figures 8-7 to 8-11
6 to 8	BEECHEY LAKE BASIN Figures 8-11 to 8-16
9 to 10	BATHURST INLET, SOUTHEAST AREA Figures 8-17 to 8-18
29	WILBERFORCE BASIN
11 to 12	HIGH LAKE AND ANIALIK SUPRACRUSTAL BELT Figures 8-19 to 8-20
13	EOKUK INLIER Figure 8-21
14 to 20	POINT LAKE - ITCHEN LAKE-CONTWOYTO LAKE METASEDIMENTARY BELT AND LUPIN MINE AREA Figures 8-22 to 8-42
21 to 23	RUSSELL LAKE - INDIN LAKE SUPRACRUSTAL BELT Figures 8-43 to 8-47
24 to 28	YELLOWKNIFE SUPRACRUSTAL BASIN Figures 8-48 to 8-58

FIGURE 8-1: Location key to geological figures and NTS sheets covering the Slave Province.

by granitoid rocks and marginal to a volcanic or supracrustal belt are included under the appropriate belt title.

Properties under headings 1 to 8 were reported by J.B. Seaton. With a few exceptions those under heading 9 by J. Crux and those under headings 10 and 11 by J. Brophy. The exceptions are the reports on claims AU 6, 8, 9, 12, claims AU 15, 18, 19 (under heading 9) and reports on the Spider Lake Project and on the MARLIN claims which were written by J.B. Seaton.

COURAGEOUS LAKE-MACKAY LAKE VOLCANIC BELT

This belt is roughly 60 km long and 5 km wide and trends northwesterly from the vicinity of Nodinka Narrows, on Mackay Lake, to near the north end of Courageous Lake.

NOD CLAIMS

Cominco Ltd.	Gold
700-409 Granville St.	75 M/14
Vancouver, B.C., V6C 1T2	63°63′N, 113°05′W

REFERENCES

Folinsbee (1949); Henderson (1944); Moore (1956).
DIAND assessment report: 081826.

PROPERTY

NOD 1-4.

LOCATION

The claims (Fig. 8-2) are 230 km northeasterly from Yellowknife and south of Nodinka Narrows, Mackay Lake.

HISTORY

Recorded in March 1983, the claims were acquired by Highwood Resources Ltd., which performed reconnaissance geological mapping, sampling and VLF-EM surveys during 1983.

Cominco optioned the claims from Highwood Resources.

DESCRIPTION

The claims (Fig. 8-2) cover a 10 km length of a contact between volcanic and sedimentary rock at the eastern margin of the Courageous Lake-Mackay Lake Volcanic Belt.

CURRENT WORK AND RESULTS

Mapping by Cominco in 1984 showed that the claims are underlain, along their western margin, by massive and pillowed mafic volcanics. This unit, in turn, is underlain by an approximately 300 m thick unit of mafic tuff, which is stratigraphically succeeded by a roughly 5 m thick unit of felsic tuff and mixed felsic and mafic tuffs. This predominantly felsic unit is overlain by metagreywacke and biotite schist; both of which underlie the eastern part of the NOD claims.

The mafic volcanics have been intruded by granite and diorite 1 to 3 km west of the NOD claims. Small granitic stocks cut the upper part of the mafic volcanic sequence, but not the felsic unit.

An IP survey along six lines over part of NOD 1, 2 was used to explore the contact between the volcanic and sedimentary rocks. On the most southerly line coincident high chargeability and low resistivity anomalies were recorded at the top of the volcanic sequence.

Assays of samples, taken mainly from the thin felsic unit beneath the sediments, found only weakly anomalous gold concentrations. The gold content of most samples was below the limit of detection.

MATTHEWS LAKE AREA

Giant Yellowknife Mines Ltd	Gold
Box 3000	76 D/3
Yellowknife, NWT, X1A 2M2	64°00′-64°06′N
	111°08′-111°18′W

REFERENCES

Lord (1951); Moore (1956); McGlynn (1971); Seaton (1978, 1984); Seaton and Crux (1985); Seaton and Hurdle (1978).
DIAND assessment reports: 061720, 062115 and 080106.

PROPERTY

"Salmita" Property Claims: LT 1-3; LUFF 1-4; SALERNO 1-18; TOUGH 1-6.
"Taurcanis" or "Tundra" Property Claims: JEJA 1-6; MAD 1-18; REP 1-12; WIN 1-18.
Roxwell Gold Mines Ltd. Claim: BS 1.

LOCATION

The claims are roughly 240 km northeasterly from Yellowknife and lie east of to 5.5 km south-southeast of Matthews Lake (Fig. 8-2).

HISTORY

The "Salmita" and "Taurcanis" properties were staked in 1945 and their early history is reported by Lord (1951) and McGlynn (1971). The Salmita property was acquired by Salmita Northwest Mines Ltd. in 1945. The Taurcanis property was optioned to Trans-American Mining Corporation Ltd. in 1945, and transferred to Bulldog Yellowknife Gold Mines Ltd. in 1948. Bulldog Yellowknife was reorganised as Taurcanis Mines Ltd. in 1956 and again as Tundra Gold Mines Ltd. in 1963.

Subsequent developments on the Salmita property are summarized by Seaton (1978, 1984), Seaton and Crux (1985), and Seaton and Hurdle (1978). Giant Yellowknife Mines Ltd. optioned the property from Bluebell Enterprises Ltd. in 1974, commenced sinking a decline in 1975 and started production at Salmita Mine in 1983. Giant Yellowknife Mines Ltd. acquired the Tundra Gold Mines Taurcanis property together with the Tundra Mill (Fig. 8-3), which is used to treat the Salmita ore.

DESCRIPTION

The geology of the Matthews Lake area is described by Moore (1956) and the geology of the gold showings by Lord (1951) and Moore (1956). McGlynn (1971) described the Olsen showing on TOUGH 4.

CURRENT WORK AND RESULTS

Most drilling in the Matthews Lake area was done on mining leases (to which the claims of the Salmita and Taurcanis properties have been converted) and was not reported as representation work. BS 1 was explored by Giant Yellowknife Mines Ltd. and Cominco Ltd. under option from

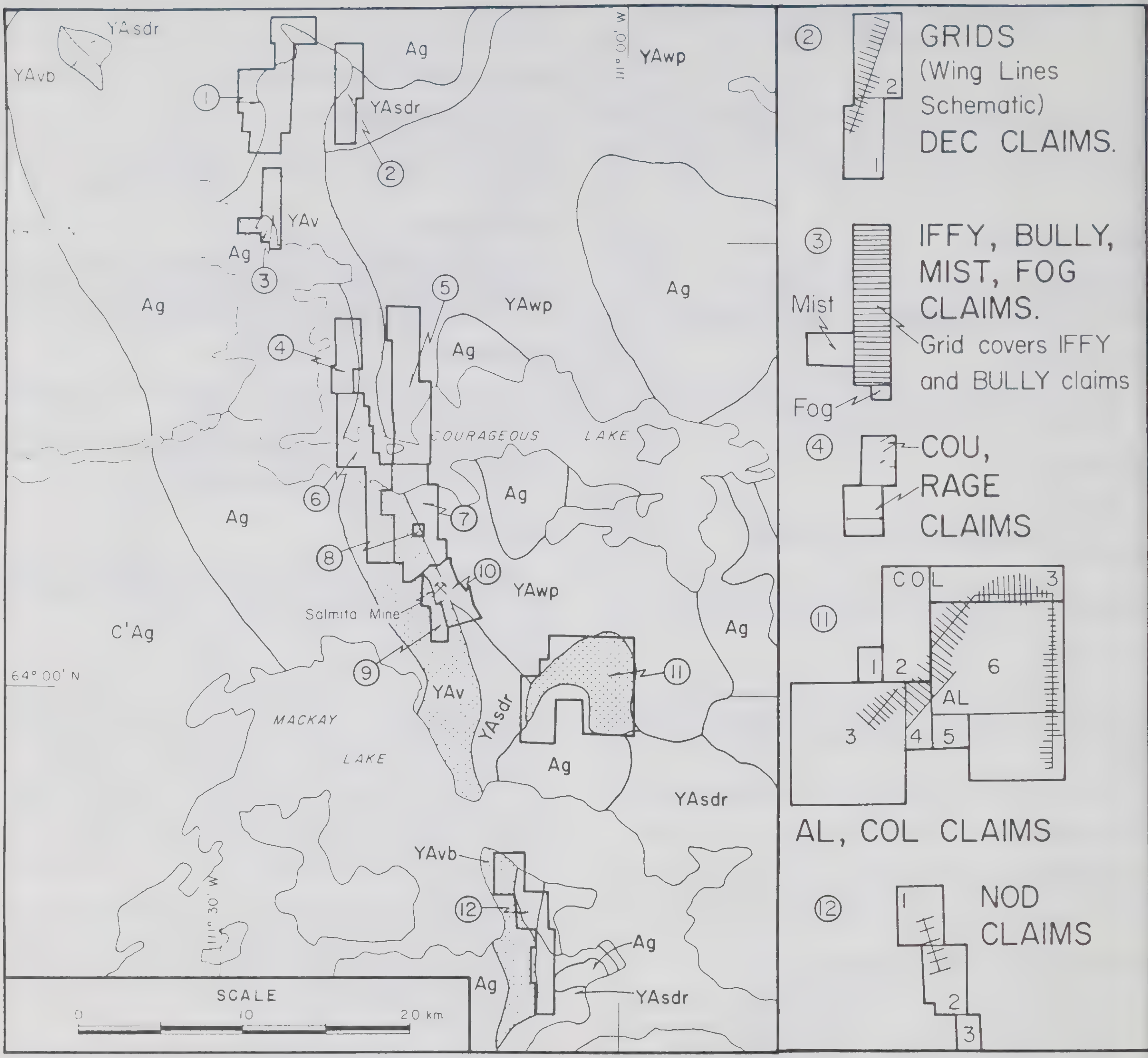


FIGURE 8-2: Regional geology and properties of the Courageous Lake - Mackay Lake Volcanic Belt (geology from McGlynn, 1977).

the claim holder, Roxwell Mines Ltd. BS 1 was explored by an IP, resistivity, and magnetic survey prior to drilling in 1984 and 1985.

From June through December 1984, 4263.5 m in 30 holes, and from February through November 1985, 12,535 m in 117 holes were reported drilled in the Matthews Lake area by Giant Yellowknife Mines. The proximity of the drilling done in the Matthews Lake area to the margin of the Courageous Lake-MacKay Lake Volcanic Belt is apparent in Figure 8-3.

AL AND COL CLAIMS

Placer Development Ltd.	Gold
Box 49330, Bentall PO Station	76 D/3
Vancouver, B.C., V7X 1P1	64º02'N, 111º02'W

REFERENCES

Dillon-Leitch (1979, 1981); Folinsbee (1949); Henderson (1944).

DIAND assessment report: 081905.

PROPERTY

AL 3-7, COL 1-3.

LEGEND

ARCHEAN

PLUTONIC

Ag	Quartz diorite, granodiorite, quartz monzonite and granite. In part phyritic. Granitic rocks undivided.

YELLOWKNIFE SUPERGROUP

YAsdr	Cordierite-andalusite-bearing schists and other metamorphic equivalents of Yellowknife Supergroup sedimentary rocks.
YAwp	Greywacke, mudstone, turbidites. Includes minor quartzite, conglomerate, limestone and tuff.
YAvb	Mafic to intermediate flows, tuff, agglomerate with minor undifferentiated felsic volcanic rocks.
YAv	Volcanic rocks, undivided.
C'An / C'Ag	Migmatite, granitic gneisses or granitic rocks that may be in part older than Yellowknife Supergroup.

PROPERTIES

1. FELS, LICH, SIAL, SPAR, TUFF
2. DEC
3. BULLY, FOG, IFFY, MIST
4. COU, RAGE
5. MOG 1,4
6. MOG 2,3: BULL 3,4
7. BERTHA, FAT
8. RED
9. CAROL
10. LUFF, SALERNO, TOUGH
11. AL, COL
12. NOD

LOCATION

The property (Fig. 8-2) is roughly 5 km north of Mackay Lake, 8 km due east of Tundra Mill and 260 km northeasterly from Yellowknife.

HISTORY

The claims were staked for Colray Resources Inc.; the AL claims in July 1983 and the COL claims in September 1984. They were later optioned to Placer Development Ltd.

DESCRIPTION

The AL-COL claim group covers an inlier of metavolcanics about 5 km east of the Courageous Lake - Mackay Lake Volcanic Belt.

The largely mafic volcanics of the inlier have been subjected to doming, peripheral to a granitoid intrusive and its satellite stock. Cleavage and bedding in the volcanics and overlying metasediments strike parallel or subparallel to the intrusive contact, and dip vertically to steeply away from the contact. Pillows and graded beds indicate that the supracrustal rocks young outward from the granitoid intrusion. Metasediments in the southern part of the property are on the high grade side of the cordierite isograd. Folinsbee (1949) and Henderson (1944) regionally mapped the area at 1:253,440. More detailed mapping was done by Dillon-Leitch (1981).

CURRENT WORK AND RESULTS

A grid, totalling 47 line km, was constructed over a contact between volcanic and sedimentary rocks. Magnetic and VLF-EM surveying and soil and rock sampling were done in search of gold.

Soil sampling (analyses for Mo, Cu, Zn, Pb, Ag, Au, As, Mn, Fe, Sb) did not outline any clearly defined anomalies and only one rock sample was distinctly anomalous (0.79 ppm Au).

Magnetic and VLF-EM surveys totalled 37 line km. A VLF-EM conductor coincides with a gossan-capped chert unit the length of the three adjoining grids (Fig. 8-2). This unit, however, was not found to be significantly auriferous. Other shorter en-echelon conductors were outlined. There is good correlation between VLF-EM conductors and magnetic anomalies.

Though the cherty unit with altered felsic tuff containing pyrite and pyrrhotite gave a geophysical response it was not found to be significantly auriferous.

GIANT 1 CLAIM

Giant Yellowknife Mines Ltd.	Gold
Box 3000	76 D/3
Yellowknife, NWT	64º02'30''N,
X1A 2M2	111º09'30''W

REFERENCES

Moore (1956).
DIAND assessment report: 081809.

PROPERTY

GIANT 1.

LOCATION

The claim straddles the road from Tundra Mill to the airstrip servicing Salmita Mine, and is roughly 240 km northeasterly from Yellowknife (Fig. 8-3).

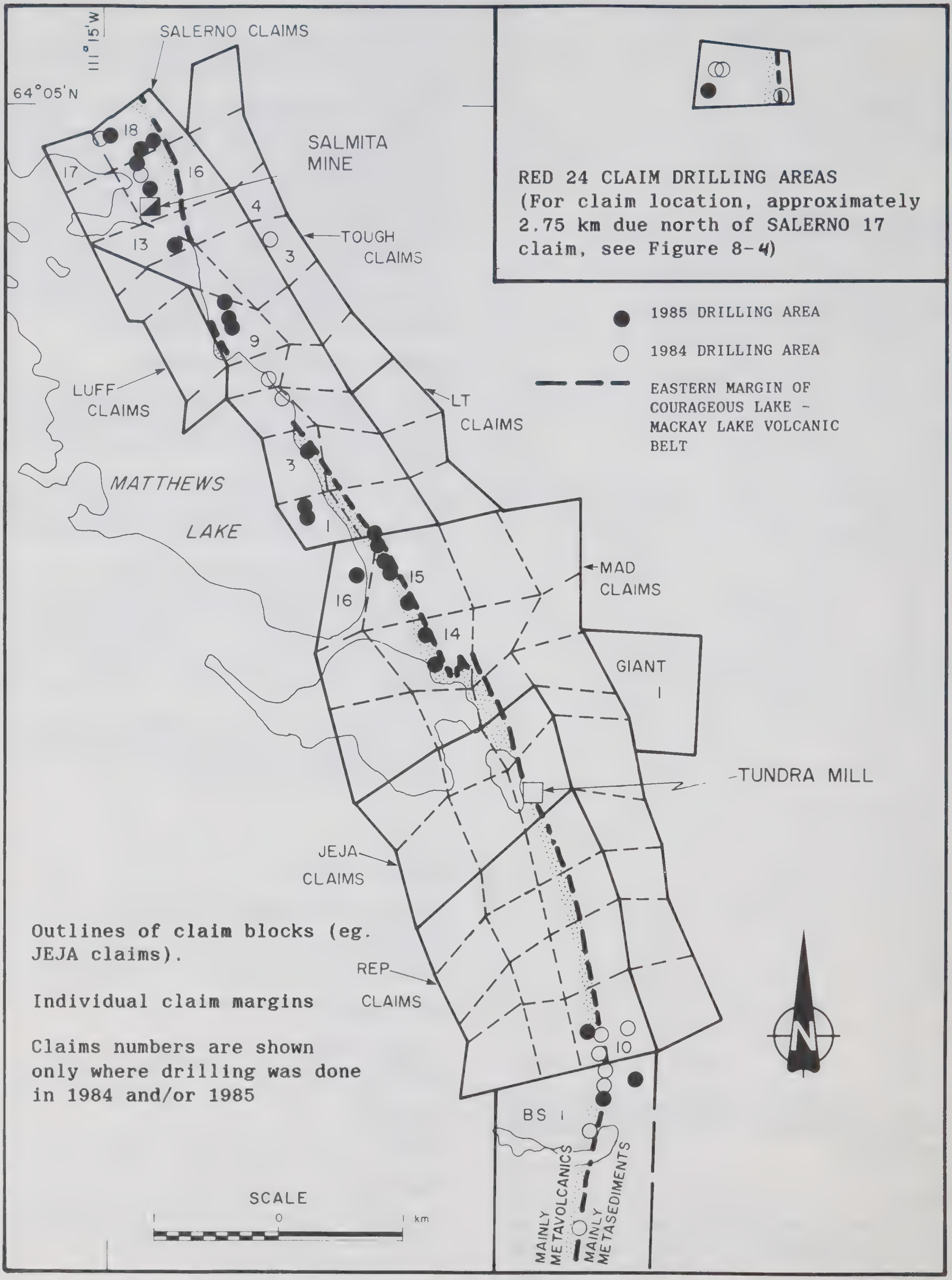


FIGURE 8-3: Diamond drilling by Giant Yellowknife Mines Ltd. in the Matthews Lake area.

HISTORY

GIANT 1 was recorded in November 1982. Work done in 1982 has not been recorded in previous Mineral Industry Reports and is reported here under "Current Work and Results".

DESCRIPTION

The claim is underlain by Yellowknife Supergroup metasediments and is about 1 km east of the eastern margin of the Courageous Lake-Mackay Lake Volcanic Belt.

CURRENT WORK AND RESULTS

In 1982, seven X-ray holes were drilled to test overburden, which was mainly glacial sand. Holes completed ranged from 2.08 to 5.14 m in length. A total of 21.46 m was drilled.

BERTHA 4, CAROL AND OTHER CLAIMS

Noranda Exploration Co. Ltd.	Gold
4-2130 Notre Dame Ave.	76 D/3
Winnipeg, Man., R3H 0K1	64º03'N, 111º14'W

REFERENCES

Dillon-Leitch (1979, 1981); Folinsbee (1949); Henderson (1944); Seaton (1983a,b, 1984) Seaton and Crux (1985).
DIAND assessment report: 081900.

PROPERTY

BERTHA 1,4; CAROL 1, 2; 36 FAT claims; 2 SMALL claims; 14 STOUT claims; TALL 87.

LOCATION

The claims are at Matthews Lake (Fig. 8-4), 235 km northeasterly from Yellowknife. The property adjoins that of Salmita Mine.

HISTORY

Gold was discovered in the Salmita area in 1939. In the forties the property was staked as the PONDO, B-7 and CL claims.

In 1976, at a time when interest in the Courageous Lake-Mackay Lake Volcanic Belt was focussed on its silver-base metal potential, Noranda Exploration Company Ltd. flew a combined EM and magnetic survey of the belt in search of massive sulphide deposits. The survey was followed by extensive staking and exploration (Seaton 1983a,b, 1984, 1985). In 1981, exploration emphasis shifted from silver and base metals to gold.

The SMALL claims were recorded in November 1976, and the FAT, STOUT and TALL claims in January and April 1977. Bertha 1 was recorded in July 1981; Bertha 4 in July 1983. CAROL 1 and 2 were recorded in August 1983 to acquire ground left open when the MAT claims lapsed.

Work in 1983 on BERTHA 1 and the five adjoining claims is summarized in Seaton and Crux (1985).

DESCRIPTION

Much of the property is covered by Matthews Lake (Fig. 8-4), and is apparently largely underlain by a belt of felsic volcanics. In the western part of the property, mafic volcanics stratigraphically underlie the felsic volcanics and are intruded by quartz porphyry and quartz-feldspar porphyry. In the northeastern part, along the eastern margin of the Courageous Lake-Mackay Lake Volcanic Belt, metasediments (greywacke, phyllite and mica schist) overlie the felsic volcanics (Moore, 1956).

The Courageous Lake-Mackay Lake Volcanic Belt forms a steeply dipping, easterly facing homoclinal sequence with minor local folds. The regional geology is shown in Folinsbee (1949) and Henderson (1944). The most recent, detailed work, other than that found in assessment reports, is by Dillon-Leitch (1979, 1981).

CURRENT WORK AND RESULTS

Work in 1984 and 1985 was in joint venture with Getty Mines Ltd. In 1984, work was concentrated on and around the revised FAT 4 grid that lies mainly on BERTHA 1 between Courageous and Matthews Lakes. BERTHA 1 and adjoining parts of the FAT claim block were converted to mining leases in July 1984.

During the spring of 1984, 25 NQ diamond drill holes tested the main auriferous zone on the FAT 4 grid and targets outside the zone. During the summer of 1984 work in and adjacent to the FAT 4 grid comprised grid revision and expansion, detailed geological remapping, sampling and trenching, whole rock analysis, and IP and horizontal loop EM surveys of selected areas. Magnetic susceptibility of all drill core obtained during 1983 and 1984 was determined. Ground control markers for a black and white and colour aerial photographic survey were laid out, and a contoured photo-map subsequently obtained. In the fall of 1984, 11 more NQ drill holes were completed on the main zone as well as two exploratory holes on targets outside it. Drilling during 1984 in the FAT 4 grid area totalled 6243 m.

During 1985, a grid adjoining and lying south of the FAT 4 grid was constructed. The grid totals 131.4 line km. Much of the grid was laid out over the ice on Matthews Lake (Fig. 8-4). The grid was surveyed by magnetic and VLF-EM surveys.

The magnetic survey outlined areas of mafic and felsic volcanics and a northerly trending dyke (presumably diabase). Magnetic features of lesser extent are interpreted to be due to pods of mafic rock, pyrrhotite concentrations, or, in one case, an alteration zone within felsic volcanics.

Several VLF-EM conductors were delineated, some associated with magnetic highs and some probably coincident with contacts between mafic and felsic volcanics.

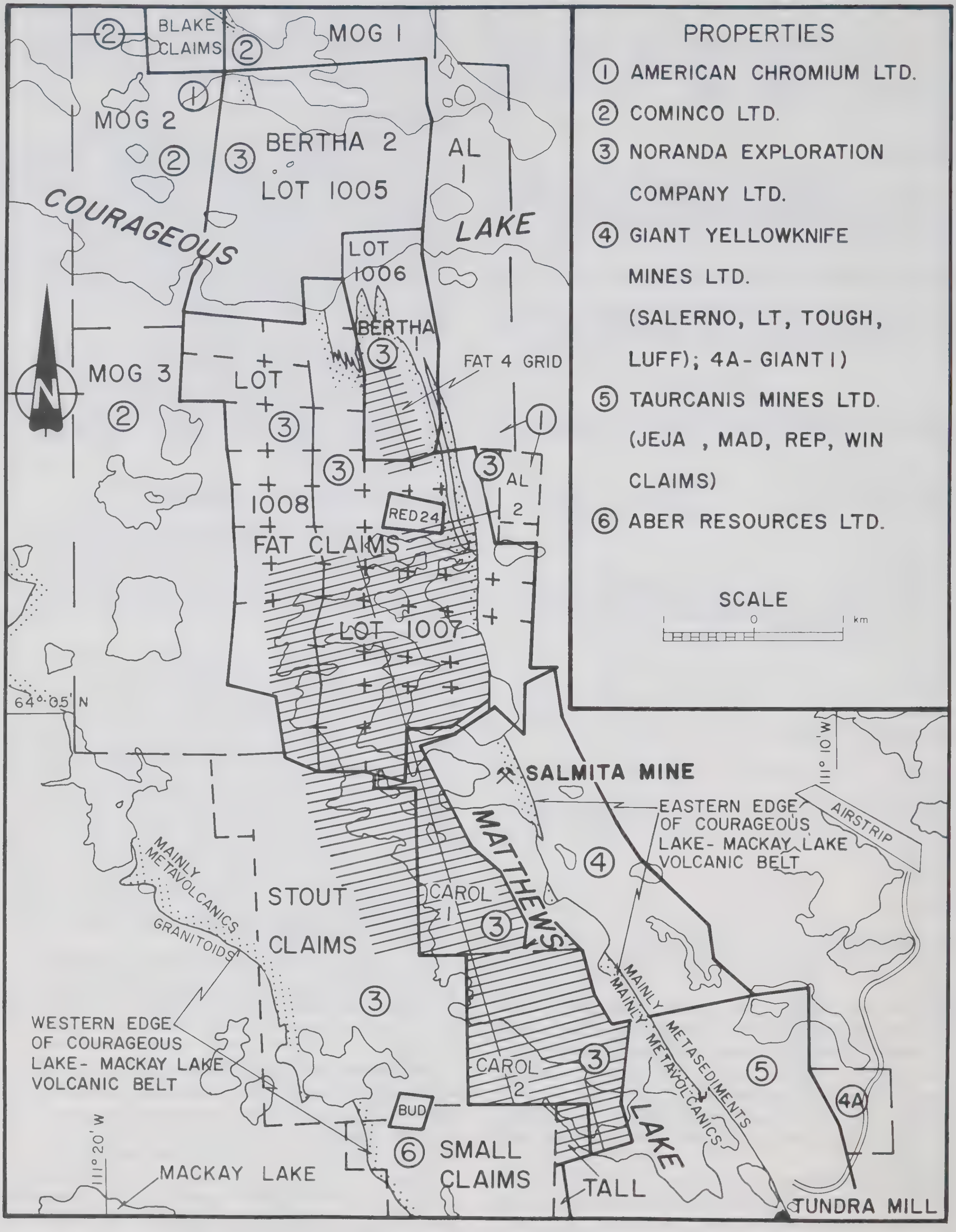


FIGURE 8-4: Grids on the BERTHA AND CAROL claims.

MOG CLAIMS

Cominco Ltd. — Gold
700-409 Granville St. — 76 D/3
Vancouver, B.C., V6C 1T2 — 64°11'N, 111°17'W

REFERENCES

Lord (1951); Moore (1956).
DIAND assessment report: 081832.

PROPERTY

BULL 3, 4; MOG 1-4.

LOCATION

The claims are roughly 250 km northeasterly from Yellowknife at Courageous Lake (Fig. 8-5).

HISTORY

MOG 1 and 4 cover part of an area staked in 1946 as the MINT group, and were acquired by Payne Yellowknife Gold Mines Ltd. later that year.

In 1947, Payne Yellowknife Gold Mines explored a gold showing near the common boundary of MINT 11 and 12. Three pits were excavated and two holes diamond drilled. Payne Yellowknife Gold Mines also reported visible gold on MINT 4, where they excavated a 10 m long trench and drilled two holes. On MINT 57 they noted aurifierous float, but drilling two holes failed to find its source.

MOG 1-4 and BULL 3 were recorded for Mr. Hugh Mogensen of Calgary, Alberta in July 1983. In May 1984, Mogensen optioned the claims to Cominco.

DESCRIPTION

Moore (1956) mapped and described the geology of the Courageous-Matthews Lakes area. Lord (1951) described the gold showings. The geology of the property, simplified from Moore (1956), is shown in Figure 8-5. The northern two MOG claims (MOG 2 and 3) are mainly underlain by mafic volcanics. The MINT group showings are in the area underlain by metasediments; the positions of MINT 4, 11 and 57 are indicated in Figure 8-5.

BULL 3 is largely underlain by mafic volcanics; and BULL 4, by mafic and less abundant felsic volcanics. The northwestern part of BULL 4 is underlain by granodiorite.

CURRENT WORK AND RESULTS

In 1984, two grids (Fig. 8-5) were established comprising 41 line km on MOG 1 and 4, and 27 line km mainly on MOG 4. MOG 2 is largely water covered. The grids were mapped and explored by magnetic and VLF-EM surveys. The northern grid area is underlain by metasediments, intruded by northerly to north- northwesterly trending diabase dykes. The southern grid is underlain by mafic volcanics, except for small areas underlain by gabbro and diabase. Although the diabase outcrops sparsely on the southern grid, it is indicated below overburden by linear magnetic features, as it is on the northern grid.

A VLF-EM anomaly along the western margin of MOG 4 is close to a contact between felsic volcanic and metasedimentary rocks. Two parallel, northerly trending, discontinuous conductive zones were delineated on the southern grid. These coincide, in part, with rusty pyritic zones in mafic volcanics.

Linear magnetic highs were outlined and are probably caused by diabase dykes that trend northerly to northwesterly. Samples taken from rusty frost-heaved material contained up to 178 ppb Au, (on the southern grid end of the eastern conductor). Anomalously high gold assays were also obtained from the sheared contact zones between small arsenopyrite-bearing, quartz-feldspar porphyry dykes and quartz veins, which cut metasediments in the northern half of the property.

In the spring of 1985, magnetic, VLF-EM and IP surveys over the ice of Courageous Lake outlined local coincident anomalies on MOG 2. During the summer, these surveys were extended by reconnaissance lines between lakes onto BULL 3 and BULL 4 and adjacent ground. Additional geophysical anomalies were found.

COU, RAGE CLAIMS

Placer Development Ltd. — Gold
Box 49330, Bentall PO Station — 76 D/3
Vancouver, B.C., V7X 1P1 — 64°12'N, 111°22'W

REFERENCES

Dillon-Leitch (1979, 1981); Folinsbee (1949); Henderson (1944).
DIAND assessment report: 081912.

PROPERTY

COU, RAGE.

HISTORY

The claims were recorded in August 1983.

LOCATION

The claims (Fig. 8-2) are slightly east of the north arm of Courageous Lake, and 245 km northeasterly from Yellowknife.

DESCRIPTION

The claims are on the western margin of the northern part of the Courageous Lake-Mackay Lake Volcanic Belt, the broad regional setting of which is shown by Folinsbee (1949) and Henderson (1944).

The entire property is underlain by biotite granite and biotite granodiorite, except for relatively small parts of the northern and eastern margins of COU where mafic volcanics and felsic volcanics outcrop respectively (Dillon-Leitch, 1981). The felsic volcanics are intruded by a body of metagabbro at the volcanic granitoid contact (Fig. 8-2).

CURRENT WORK AND RESULTS

Three rock samples, taken from the metagabbro near the eastern margin of COU, showed background metal contents (analyses for Mo, Cu, Zn, Pb, Ag, Au, As, Mn, Fe, Sb) typical of the Courageous Lake-Mackay Lake Volcanic Belt.

Of 53 soil samples taken, 35 were from the northeastern part of COU and the remainder from RAGE. Three samples have slightly anomalous gold contents, but all three are single point anomalies.

LEGEND

PROTEROZOIC

- Diabase, gabbro
- Biotite granodiorite and related rocks
- 7 Quartz diorite and related rocks

ARCHEAN

YELLOWKNIFE GROUP (1-5)

- Greywacke, slate
- Meta-gabbro
- Felsic lavas (meta-rhyolite and meta-dacite)
- Mafic agglomerate and breccia
- 1 Mafic lavas (meta-andesite and meta-basalt); minor phyllite and mica schist(5a)

- A Quartz porphyry, quartz-feldspar porphyry, feldspar porphyry; minor aplite and mafic lava. In part related to felsic lavas (3)
- Bedding, general trend lines (direction of dip known, upper side of bed unknown)
- Bedding (direction of dip known, tops unknown; overturned)
- Schistosity, gneissosity (inclined, vertical)
- Fault zone, shear zone (defined, approximate, assumed)
- Anticlinal axis (defined, top of bed determined by graded bedding)
- Synclinal axis (defined, top of bed determined by graded bedding)
- Glacial striae
- Esker
- x Mineral occurrence

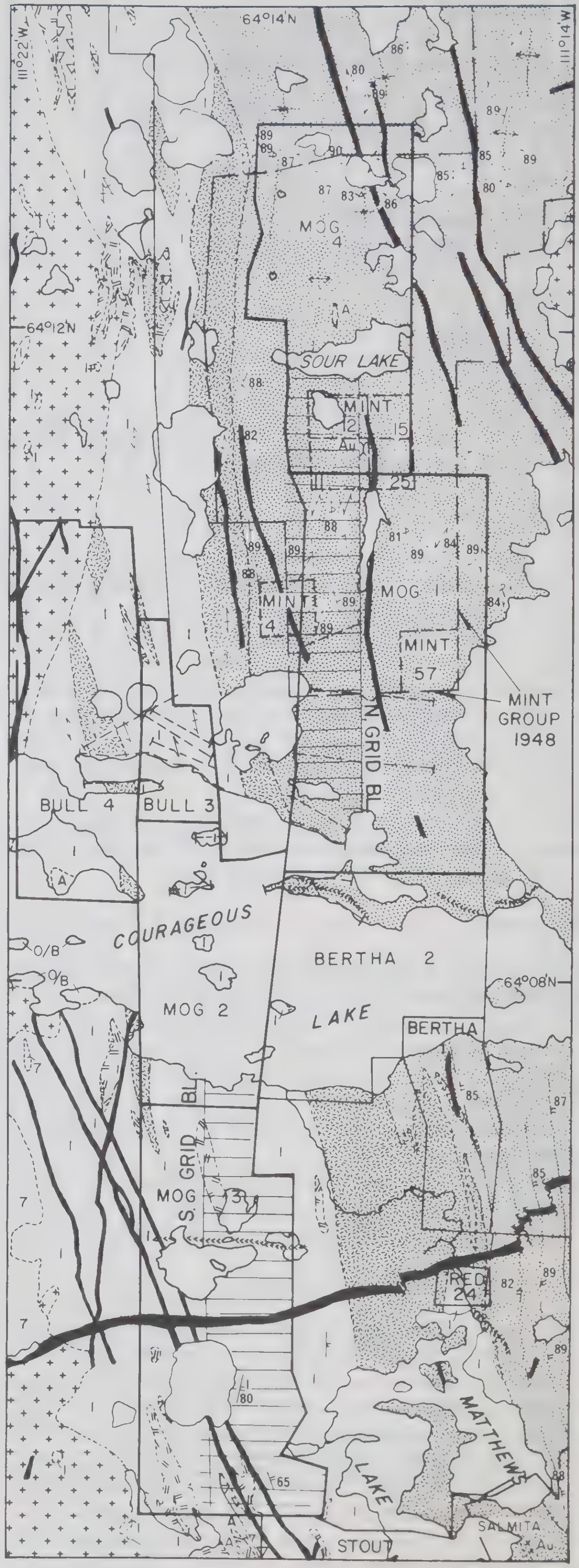


FIGURE 8-5: Geology of the MOG, BULL, MINT and other claims, Courageous Lake (geology from Moore, 1956).

BULLY, FOG, IFFY, MIST CLAIMS

Placer Development Ltd.	Gold
Box 49330, Bentall PO Station	76 D/5,6
Vancouver, B.C., V7X 1P1	64°17'N, 111°27'W

REFERENCES

Moore (1956); Dillon Leitch (1979, 1981).

PROPERTY

BULLY, FOG, IFFY, MIST claims.
DIAND assessment report: 081906.

LOCATION

IFFY, BULLY and MIST are on the northeast shore of Courageous Lake. FOG covers most of an island in Courageous Lake. The claims are about 260 km northeasterly from Yellowknife.

HISTORY

The claims were recorded in September 1983 for Colray Resources Inc., and later optioned to Placer Development Ltd.

DESCRIPTION

The property is underlain by intermediate to mafic metavolcanics, minor amounts of felsic metavolcanics, synvolcanic intrusions of metagabbro and intrusive biotite granite (Dillon-Leitch, 1981). The mafic volcanic rocks are locally sheared and carbonatized.

CURRENT WORK AND RESULTS

Work in 1985 comprised: construction of 22.5 line km of grid (Fig. 8-2), reconnaissance geological mapping and prospecting, soil sampling (analyses for Mo, Cu, Zn, Pb, Ag, Au, As, Mn, Fe, Sb) and a combined magnetic and VLF-EM survey of the grid.

A northeasterly to northerly trending foliation in metagabbro and metabasalt is locally transitional into well defined shear and fracture systems which are commonly carbonatized and in places weakly silicified. Poorly developed stockworks of quartz and carbonate veins, less than 20 cm thick, were found in the shear and fracture systems. Small amounts of sulphides, mainly pyrite but locally chalcopyrite, sphalerite and galena are associated with the quartz veins.

The soil sampling survey revealed only single sample anomalies. Several conductors were delineated by the VLF-EM survey. The strongest and longest conductor trends north-northwesterly through the northeastern part of the grid and coincides with a contact between massive, locally gossanous, basalt and a 50 m wide cherty metasedimentary unit enclosed within the volcanics.

FELS, LICH, SIAL, SPAR, TUFF CLAIMS

Stone Petroleums Ltd.	Gold
1730 Elveden House,	76 D/5,6
717-7th Ave. SW	64°21'N, 111°28'W
Calgary, Alta., T2P 0Z3	

REFERENCES

DIAND assessment report: 081916.

PROPERTY

FELS, LICH, SIAL, SPAR, TUFF claims.

LOCATION

The property (Fig. 8-2) is roughly 255 km northeasterly from Yellowknife and 28 km northwesterly from Salmita Mine.

HISTORY

The claims were recorded in July 1983 for R.E. Wolf, who holds them in trust for Stone Petroleums Ltd.

DESCRIPTION

The claims are on the western edge of the northern end of the Courageous Lake - Mackay Lake Volcanic Belt. The claims straddle the contact between intrusive granite to the west and metavolcanics to the east (Fig. 8-2).

CURRENT WORK AND RESULTS

In 1985, the property was geologically mapped at 1:1200. One hundred and fifty nine rock samples were taken from numerous outcrops and from 22 quartz veins found during mapping. One hundred and eighty-one soil samples were taken mostly from frost boils. Rock and frost boil samples were analysed for gold, arsenic, copper and lead. Thin sections of 15 rock samples were examined petrographically.

The property is mainly underlain by mafic metavolcanics, except for the two most northerly claims where granite predominates. In order of decreasing abundance, mafic volcanics, intermediate volcanics, metasediments and felsic volcanics underlie the other parts of the claims. Metasediments are most abundant in the western parts of FELS and LICH. Zones of disseminated to massive sulphides (mainly pyrrhotite) were frequently observed within and adjacent to quartzite beds and in felsic metatuff, but were traced by reconnaissance magnetic surveying for rarely more than 200 m. Such sulphide zones contain only trace amounts of gold.

Rock and frostboil samples revealed that several areas with anomalous concentrations of gold also had above background concentrations of other elements.

DEC CLAIMS

Placer Development Ltd. — Gold
Box 49330, Bentall PO Station — 76 D/6
Vancouver, B.C., V7X 1P1 — 64°21'N, 111°23'W

REFERENCES

Dillon-Leitch (1979, 1981); Folinsbee (1949).
DIAND assessment report: 081907.

PROPERTY

DEC 1, 2.

LOCATION

The claims are approximately 255 km northeasterly from Yellowknife and 5 km northwest of Seahorse Lake (Fig. 8-2).

HISTORY

DEC 1 and 2 were recorded in July 1983 for Colray Resources Inc. and were later optioned to Placer Development Ltd.

DESCRIPTION

The property lies on the eastern margin of the northern end of the Courageous Lake - Mackay Lake Volcanic Belt.

Mapping by Dillon-Leitch (1981) shows the eastern and southern part of the property to be underlain by Yellowknife Supergroup metasediments, and the western part by mafic metavolcanics, which are intruded by biotite granite in the northern part of the property. The andalusite and sillimanite isograds trend west-northwesterly through the southern part of the property with metamorphic grade increasing northwards.

CURRENT WORK AND RESULTS

Work in 1985 comprised grid construction, and geological mapping, rock sampling, soil sampling and VLF-EM and magnetic surveying on the grid.

The grid baseline (4.8 km long) (Fig. 8-2) trends north-northeasterly and is close to the volcanic-sediment contact for most of its length. The northern end of the grid is underlain by biotite granite. Placer Development geologists interpret the contact to be a fault, which displaces the granite contact in the northern part of the grid.

Rock and soil samples were analyzed for molybdenum, copper, zinc, lead, silver, gold, arsenic, manganese, iron and antimony. Several gossan-capped concentrations of pyrite and pyrrhotite with anomalous copper, lead and zinc were mapped in the metavolcanics. Eight arsenopyrite showings in metasediments had geochemically anomalous amounts of gold. The arsenopyrite is commonly disseminated in the silicified wall rock of quartz veins.

A VLF-EM conductor, traced the full length of the grid, is roughly coincident with the volcanic-sediment contact. Several shorter conductors were outlined and have been interpreted as caused by pyrite-pyrrhotite zones in the metavolcanics. The conductors generally correlate well with magnetic anomalies.

INDIAN MOUNTAIN LAKE-BENJAMIN LAKE SUPRACRUSTAL BELT

The Indian Mountain Lake-Benjamin Lake Supracrustal Belt extends 65 km north of the East Arm of Great Slave Lake. It has a maximum width of 25 km at its southern end and tapers northward to a sinuous "tail" of metasediments at its northern end. The Belt is flanked by granitoid rocks. Volcanic rocks are a minor component of the Belt and are generally confined at or near its western margin, where the largest exposure of metavolcanics flanks an oval area underlain by probable pre-Yellowknife Supergroup basement. The area has been mapped by Henderson (1944) and by Stockwell and others (1968) at 1:253,440 and that part covered by NTS sheet 75 M/2 by Heywood and Davidson (1969) at 1:50,000.

VOO 1 CLAIM

Domego Resources Ltd. — Copper, Lead, Zinc, Gold
208, 372 Bay St. — 75 M/2
Toronto, Ont., M5H 2W9 — 63°02'N, 110°58'W

REFERENCES

Heywood and Davidson (1969); Johnson (1974); McGlynn (1971); Thorpe (1966, 1972).

PROPERTY

VOO 1.

LOCATION

The claim covers parts of "Kennedy Lake", "BB Lake" and intervening and adjacent ground (Fig. 8-6), and is 185 km east-northeasterly from Yellowknife. It is roughly 5 km south-southeasterly from Indian Mountain Lake.

HISTORY

The ground covered by VOO 1 was staked in 1948 as part of an earlier group of 21 VOO claims. The adjoining BB claim group, now held as a mining lease by Initiative Explorations Ltd., was recorded two months earlier than the VOO group, in August 1948.

Exploration of the BB claims resulted in the discovery of two mineral deposits. One of these, the BB Zone, was first drilled by Hollinger Gold Mines Ltd. in 1948; the other, the Kennedy Lake Zone, was discovered by International Mine Services Ltd. in 1966 by drilling a geophysical anomaly beneath Kennedy Lake. The exploration history is outlined in McGlynn (1971) and Thorpe (1966, 1972).

Johnson (1974) reported the BB Zone to contain 879,984 t (970,000 tons) grading 9.5% Zn, 0.7% Pb, and 116.6 g/t Ag (3.4 oz/ton), and the Kennedy Lake Zone to contain 7.3% Zn, 1.1% Pb and 137.1 g/t Ag (4.0 oz/t).

VOO 1 was recorded in March 1983.

DESCRIPTION

Figure 8-6 shows the geology of VOO 1 simplified from Heywood and Davidson (1969). Locations of mineral deposits

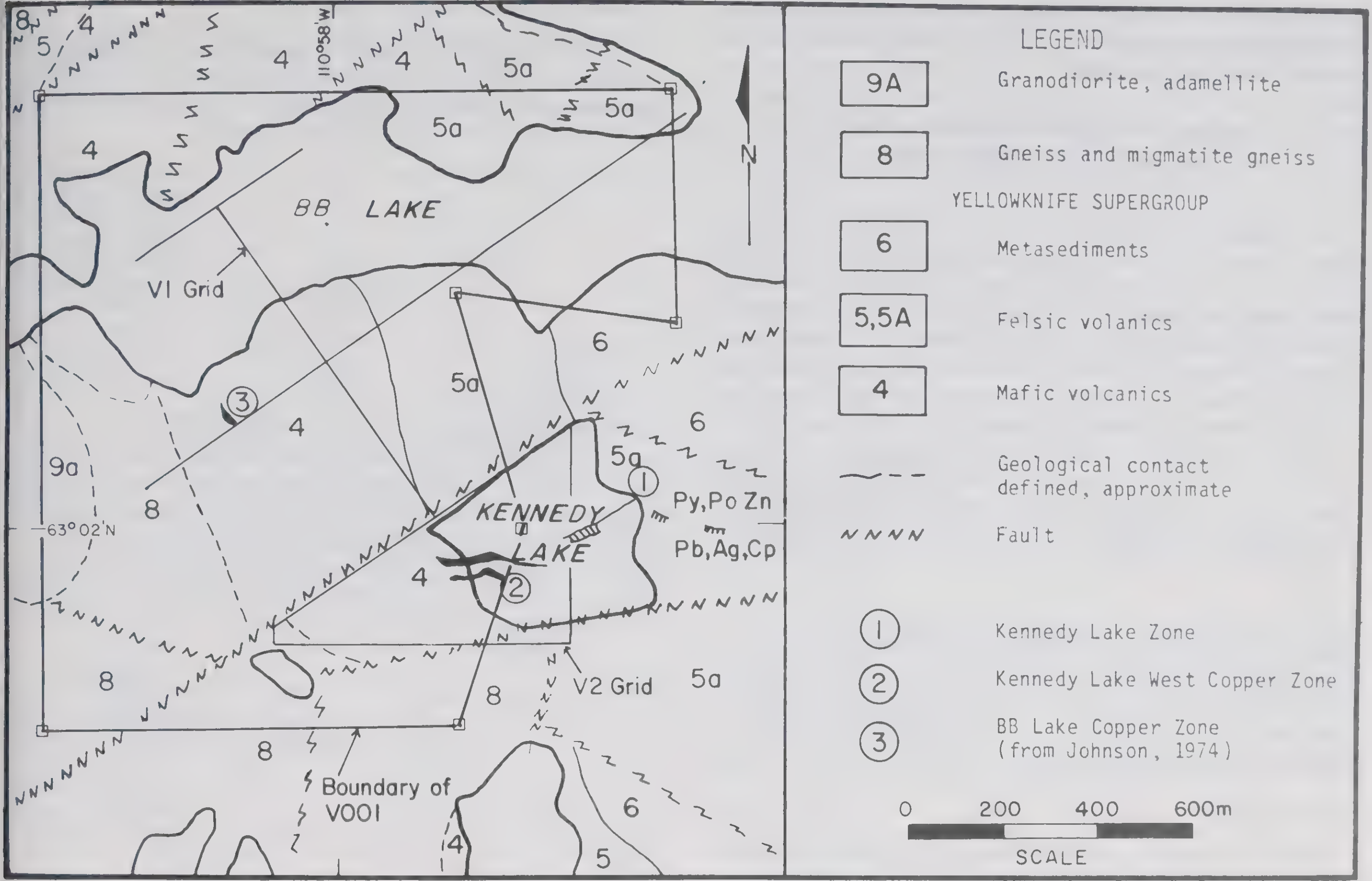


FIGURE 8-6: Geology of the VOO 1 claim, BB and Kennedy Lakes area (geology modified from Heywood and Davidson, 1969).

are from Johnson (1974). The BB Zone is mapped by Johnson as roughly 550 m east of the Kennedy Lake Zone and thus plots slightly outside the area covered by Figure 8-6.

Johnson (1974) shows the BB Lake Copper Zone, the Kennedy Lake West Copper Zone, the Kennedy Lake Zone and the BB Zone as concordant lens-like bodies at progressively higher stratigraphic levels, assuming the sequence is from mafic to felsic towards a volcanic-sediment contact northeast of Kennedy Lake. The BB Lake Copper Zone is at the contact between mafic tuff and intermediate pillow lava, the Kennedy Lake West Copper Zone in intermediate volcanics and the Kennedy Lake Zone at and near the contact between intermediate and felsic volcanics. The BB Zone has been mapped as hosted by exhalative carbonate and exhalative pyritic and siliceous rocks, enclosed in predominantly felsic volcanics.

A broad alteration zone has been outlined around the BB Lake Copper Zone, the southeastern faulted continuation of which extends at least to the west end of the Kennedy Lake West Copper Zone and probably under Kennedy Lake to the BB Zone. Several, probably related, areas of alteration have been mapped between the BB Copper Zone and Kennedy Lake.

Johnson (1974) mapped two types of alteration: the first, in which garnet is abundant, is characterized by quartz, cordierite, biotite, muscovite, cummingtonite, anthophyllite, sillimanite, spinel, ilmenite, with chalcopyrite and pyrrhotite locally abundant; the second, which tends to occur peripherally to the first or in discrete smaller parallel zones, is characterized by the absence of garnet and varying abundance of quartz, biotite, muscovite, chlorite and sillimanite. Magnetite is found locally in the inner zone of alteration which together with the sulphides, could be responsible for geophysical anomalies.

The rocks have been metamorphosed to amphibolite facies.

The volcanics, which host the mineral zones in the Kennedy Lake-BB Lake area, appear to have been folded into a tight isoclinal structure and then refolded into an open S-shaped fold of about 1500 m wavelength. The anticlinal and synclinal parts of the second generation folds plunge steeply to the northeast. The mineral zones have probably been stretched parallel to a steep northeasterly plunging lineation.

CURRENT WORK AND RESULTS

Magnetic and horizontal loop EM surveys were completed on two grids. The V-2 grid covers most of Kennedy Lake. The V-1 grid covers a larger area to the northwest, extending from the V-2 grid to near the northern shore of BB Lake.

Horizontal loop EM surveying (Maxmin at 3555 Hz and 444 Hz with stations at 100 m intervals), outlined the zone of base metal copper deposits and associated alteration that extends across Kennedy Lake. The Kennedy Lake Zone conductor coincides with a moderate magnetic high. A conductor

with strong magnetic correlation on the V-1 grid is unexplained and is in an area underlain by felsic volcanics but near the volcanic-sediment contact.

HEALEY LAKE-REGAN LAKE SUPRACRUSTAL BELT

A northwest trending branch of the northerly trending Healey Lake Supracrustal Belt extends from Healey Lake to Tarantula Lake and thence northerly to the east of the Back River Volcanic Complex to Regan Lake. The northwesterly striking supracrustal rocks include felsic to intermediate volcanics, flanked to the southwest by metasediments, and to the northeast by granitoid gneisses ranging in composition from diorite to granite (Henderson and Thompson, 1982).

In the Regan Lake area, Yellowknife Supergroup metasediments fill the gap between the Back River Volcanic Complex and the Hackett River Volcanic Belt. Locally the metasediments contain iron formation, which in places is auriferous.

PROSPECTING PERMITS 814-818

Kidd Creek Mines Ltd.	Gold
Box 175, Suite 5000	76 B/2,7
Commerce Court West	64°15'N, 106°45'W
Toronto, Ont., M5L 1E7	

REFERENCES

Henderson and Thompson (1981, 1982); Henderson and others (1982); James (1985); Seaton and Crux (1985).

DIAND assessment reports: 081655, 081866, 081867.

PROPERTY

Prospecting Permits 814-818.

LOCATION

The prospecting permits are at or near Healey Lake, 435 km northeasterly from Yellowknife (Fig. 8-7). Arms of Healey Lake extend into all permits except for Prospecting Permit 815.

HISTORY

Following 1:50,000 regional geological mapping, prospecting and sampling in 1981, Kidd Creek Mines applied for the permits, which were granted in February 1982. Main exploration targets were metamorphosed auriferous iron formation and volcanogenic base metals deposits.

Work in 1982 comprised 1:20,000 scale geological mapping, and an airborne EM (Input) and magnetic survey (Seaton and Crux, 1985).

DESCRIPTION

The geology of the Healey Lake area is been described by Henderson and Thompson (1981, 1982) and by Henderson and others (1982). The geology of the Moraine Lake area and the Thelon Front, which adjoins the Healey Lake area to the east, is described by James (1985).

CURRENT WORK AND RESULTS

In 1984 geological mapping, sampling and geophysical surveys were conducted on several grids and a gold showing was trenched. Grid and work locations are shown in Figure 8-7 and survey data are shown in Table 8-1.

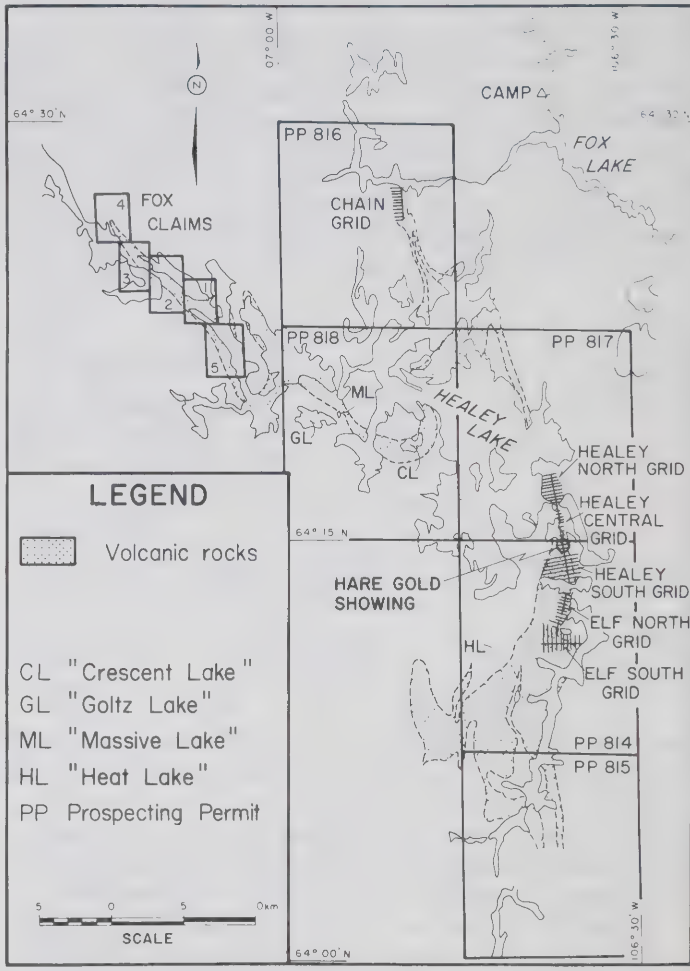


FIGURE 8-7: Prospecting Permits 814-818 and FOX claims, Healey Lake area.

Results of the surveys were somewhat discouraging. Visible gold was reported from the Hare Showing, but assays from the trenches showed patchy gold concentrations with most panel samples assaying less than 5 ppb Au.

Sampling in the South Arm Area showed that anomalously high gold concentrations were erratic in distribution and associated with arsenopyrite and sericitic alteration. In this area, mapping revealed garnet amphibolite layers and large shear zones enclosed within metasediments.

In the Healey Lake-Crescent Lake area, only one sample (from a frost heaved quartz veined rock) was found to have anomalously high gold content.

In that part of the predominantly intermediate to felsic Healey Lake Volcanic Belt explored by Kidd Creek Mines in 1984, rocks are of amphibolite metamorphic grade. The metasediments flanking the Chain Grid (Fig. 8-7) to its east are migmatitic.

Some information on grid geology and on grid geophysics, as recorded by Kidd Creek Mines, is shown in Table 8-1.

TABLE 8-1: Work done on grids on Prospecting Permits 814-818 in 1984.

GRID/AREA	GEOLOGY & SAMPLES	MAG	VLF	HLEM
ELF SOUTH	X			
ELF NORTH	X			
HEALEY LAKE S	X*	X	X	X
HEALEY L CENT	X	X	X	X
HEALEY LAKE N	X	X	X	X
S ARM AREA	X			
HEALEY LAKE				
CRESCENT LAKE	X			

** Work included trenching of the Hare gold showing in the northern half of the grid.*

In summary, although geological mapping, sampling, EM and magnetic surveys of the exploration area delineated numerous sulphide-bearing amphibolite and sheared or altered zones, analyses of samples revealed that anomalous concentrations of gold were generally unspectacular and scattered. Significantly, the only showing with visible gold was low in sulphides and did not present a geophysical target.

BR 1 CLAIM

Back River Joint Venture	Gold
c/o Trigg, Woollett, Olson	76 B/13
Consulting Ltd.	68°52'N,107°43'W
10504 - 103 St.	
Edmonton, Alta., T5H 2V4	

REFERENCES

Henderson (1982); Lambert (1978, 1981); Moore (1977); Seaton (1978); Schiller (1965); Schiller and Hornbrook (1964).

DIAND assessment reports: 017110, 017111, 017112, 017114, 017428, 061438, 080255, 080292, 081821.

PROPERTY

BR 1.

LOCATION

The property (Fig. 8-8) is roughly 435 km northeasterly from Yellowknife and close to the west bank of the Back River.

HISTORY

The exploration history of the area, commencing in 1961 and continuing into the mid-seventies, has been summarized by Schiller and Hornbrook (1964), Schiller (1965), Seaton (1978) and documented in the several DIAND assessment reports listed above.

Work by the Back River Joint Venture in 1983 consisted of 1:1000 geological mapping, prospecting and rock and soil sampling over a grid (Fig. 8-8). Soil samples were analyzed for gold and arsenic.

DESCRIPTION

The regional geology has been described, mapped and compiled by Lambert (1978, 1981) and by Henderson (1982).

Mapping of the grid on the BR 1 claim in 1983 (DIAND assessment report 081821) showed it to be underlain by mainly dacitic and andesitic volcanics. Enclosed in the volcanic sequence is an iron formation unit, which comprises magnetite-hematite-chert iron formation, pyritiferous black carbonaceous slate and black laminated chert. Moore (1977) wrote an M.Sc. thesis on the geology and geochemistry of gold-bearing iron formation and associated rocks in the area.

CURRENT WORK AND RESULTS

Sampling in 1983 showed that both volcanics and sediments on the property host asurifierous quartz veins, but not in sufficient number, size or grade to encourage further work.

MATE 1 CLAIM

Silver Hart Mines Ltd.	Gold
209, 320 Sioux Road	76 B/13
Sherwood Park, Alta., T8A 3X6	64°53'N, 107°41'W

REFERENCES

Lambert (1978, 1981); Lambert and Henderson (1980); Schiller (1965); Schiller and Hornbrook (1964); Seaton (1978); Seaton and Crux (1985).

DIAND assessment reports: 017093, 017111, 017114, 017428, 061313, 061438, 080255, 080292, 081367, 081808.

PROPERTY

MATE 1.

LOCATION

The claim straddles the Back River (Fig. 8-9), 430 km northeasterly from Yellowknife.

HISTORY

Cominco Ltd. discovered gold showings close to the Back River in 1961, and staked them as the TOBY and RUBY claim groups. The initial discovery (D Zone showing) was explored by diamond drilling (14 holes, totalling 1428 m), delineating a north-northeasterly trending zone of locally pyritic quartz veins and lenses (Toby Quartz) along a strike length of 1040 m (Schiller, 1965). Although a few higher gold assays were obtained, most samples assayed less than 2 g/t Au.

Most of the claims of the RUBY and TOBY block, extending 25 km along the Back River, were allowed to lapse in 1972. The D Zone area was restaked in 1974 as PENNY 1-12 by J. McMullin and J.L. Tinsdale and transferred in June 1975 to United Reef Petroleums Ltd. Ground adjoining the PENNY group to the north, south and west was restaked by Cominco in 1974 as part of the GAS, JAC, SY groups (Seaton, 1978). During 1974 and 1975 the PENNY claims were explored by geological mapping, EM and magnetic surveys (DIAND assessment reports 061313, 061438, 080255). The claims lapsed in 1981.

MATE 1, covering the ground previously held as the PENNY group, was recorded in September 1983. Silver Hart Mines tested the D Zone east of the Back River near the gossan, during 1983 by surface sampling and drilling ten

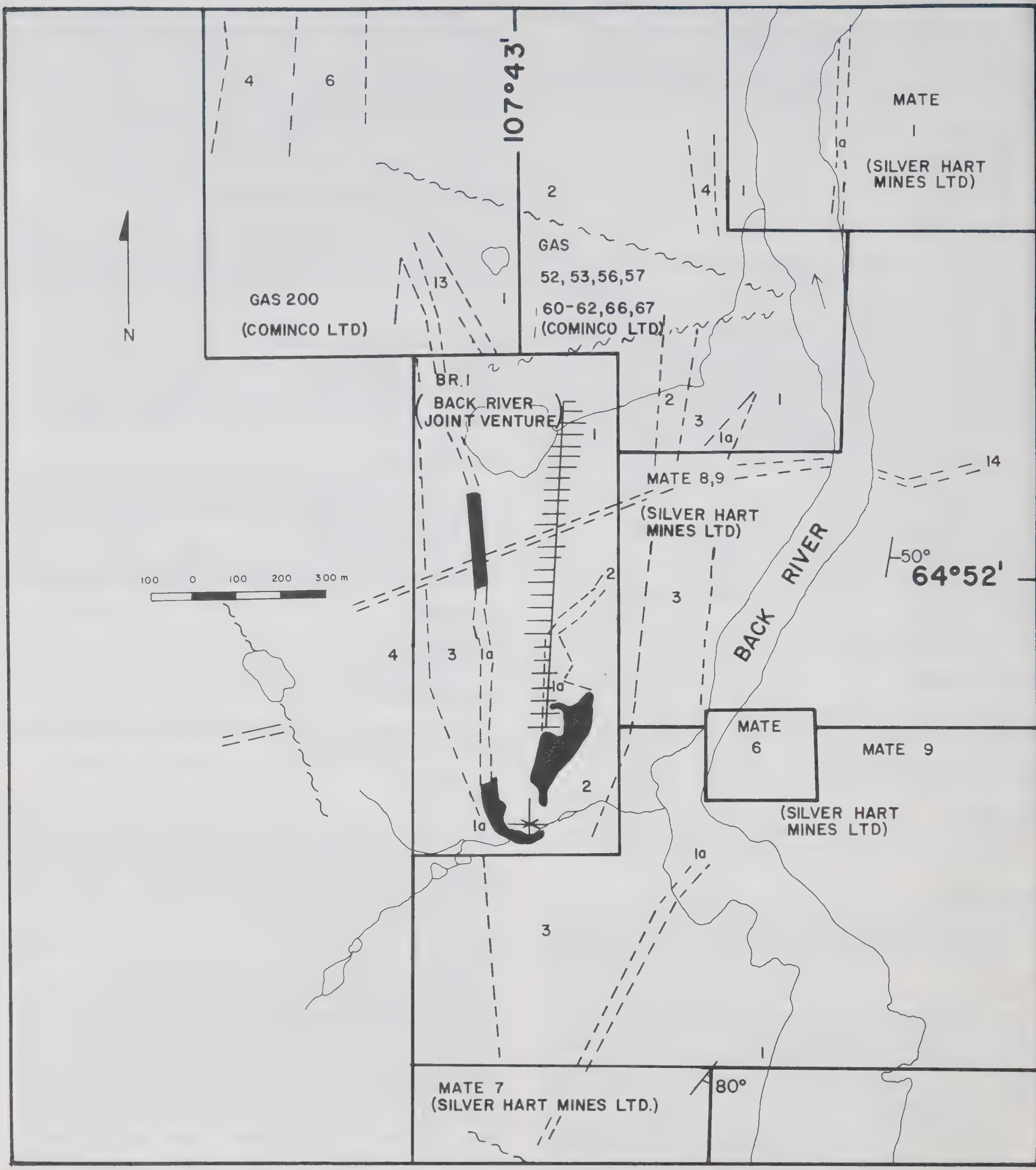


FIGURE 8-8: Geology of the BR 1, GAS and MATE claims (geology simplified from Lambert, 1981).

LEGEND

PROTEROZOIC

14 Meta-gabbro, -diabase; dykes trending northeasterly; age uncertain

13 Meta-gabbro, -diabase, -quartz gabbro; northwesterly to north-northwesterly trending dykes, sills and intrusions along outer ring fractures near Rusty and Thlewycho Lakes; may include part of Unit 15; age uncertain.

ARCHEAN

BACK RIVER GROUP

6 Rhyolite, massive, flow layered, brecciated; sparsely porphyritic (quartz, feldspar), white, buff and pale grey weathering rocks; minor tuff; includes rocks of dacite composition; domes, flows, dykes and ring-fracture intrusions; composite dome complexes include massive quartz phyric rhyolite, quartz-feldspar phyric dacite and associated flanking breccias, conglomerate and volcarenite; breccias commonly impregnated with carbonate.

4 Felsic tuffs, breccias, massive units dominantly of dacitic composition; grey, white, pink and pale green weathering rocks containing sparse phenocrysts of quartz and feldsapr; may contain part of Unit 5 and rocks of rhyolitic composition: volcanic domes, lavas and associated air-fall and ash-flow tuffs; minor conglomerate

3 Andesitic lavas, breccias and volcaniclastic rocks; minor conglomerate:

2 Basalt, pillowed and massive lava

BEECHEY LAKE GROUP

1 | 1a Greywacke-mudstone turbidites, siltstone, grit, minor conglomerate, graphitic shale, tuffaceous sandstones and tuff; rhyolite and dacite boulder paraconglomerate and debris flow deposits adjacent to felsic dome complexes

1a - Iron formation, oxide (chert-jasper-hematite), silicate (amphibole) and sulphide (pyrite, pyrrhotite) and carbonate facies

SYMBOLS

Geological boundary (defined, approximate, assumed).

Bedding (inclined, top known).

holes, totalling 501 m (DIAND assessment report 081808). Main rock types intersected by the southern group of six drill holes were a porphyritic amphibole-rich rock containing amygdules and carbonate stringers and interpreted to be a dyke or flow, underlain or adjoined to the west by a quartz vein pyrite zone and a locally brecciated pyritic quartz-carbonate-chlorite schist unit. Four of these holes ended in basaltic flow top breccia; two penetrated shale or siltstone before entering the amphibole porphyry. The northern group of four holes, separated from the southern group by roughly 430 m, intersected shale that was commonly black, graphitic and pyritic. Other lithologies intersected by these four holes include amphibolitic and feldspathic dykes or flows.

As in the case of earlier drilling by Cominco, core samples gave generally low assays. All but 5 of 200 samples assayed less than 1 g/t Au. The best intersection was 16 g/t Au across 1.8 m of quartz-pyrite vein in a brecciated zone in Hole 83/10.

DESCRIPTION

The property is at or near the western margin of the Back River Volcanic Complex (Lambert 1978, 1981). Although Lambert (1981) has mapped a northerly trending gossan-capped unit of iron formation (facies unspecified) as striking across MATE 1 on both sides of the Back River, drilling in 1983 did not intersect iron formation beneath the gossan east of the river. The gossan is easily explained by the high pyrite content of sections of a quartz-pyrite zone, which locally contains more than 50% pyrite across a few metres.

The quartz vein pyrite zone, intersected in the southern group of six holes, appears to obliquely cross-cut and contain brecciated inclusions of a quartz-carbonate-chlorite schist unit and, is thus, non-stratiform. The adjoining porphyritic amphibolitic unit is amygdaloidal. Iron formation has been reported on the BR claims 2 km to the south-southwest of the southwest group of holes, as well as at a similar distance to the north-northeast.

CURRENT WORK AND RESULTS

In 1984, 2 holes totalling 112 m were drilled on MATE 1.

GAS CLAIMS (Western Block)

Cominco Ltd.
700-409 Granville St.
Vancouver, B.C., V6C 1T2

Gold
76 B/13
64°53′N, 107°42′W

REFERENCES

Lambert (1978, 1981): Schiller (1965); Schiller and Hornbrook (1964); Seaton (1978, 1984); Wright (1957, 1967).

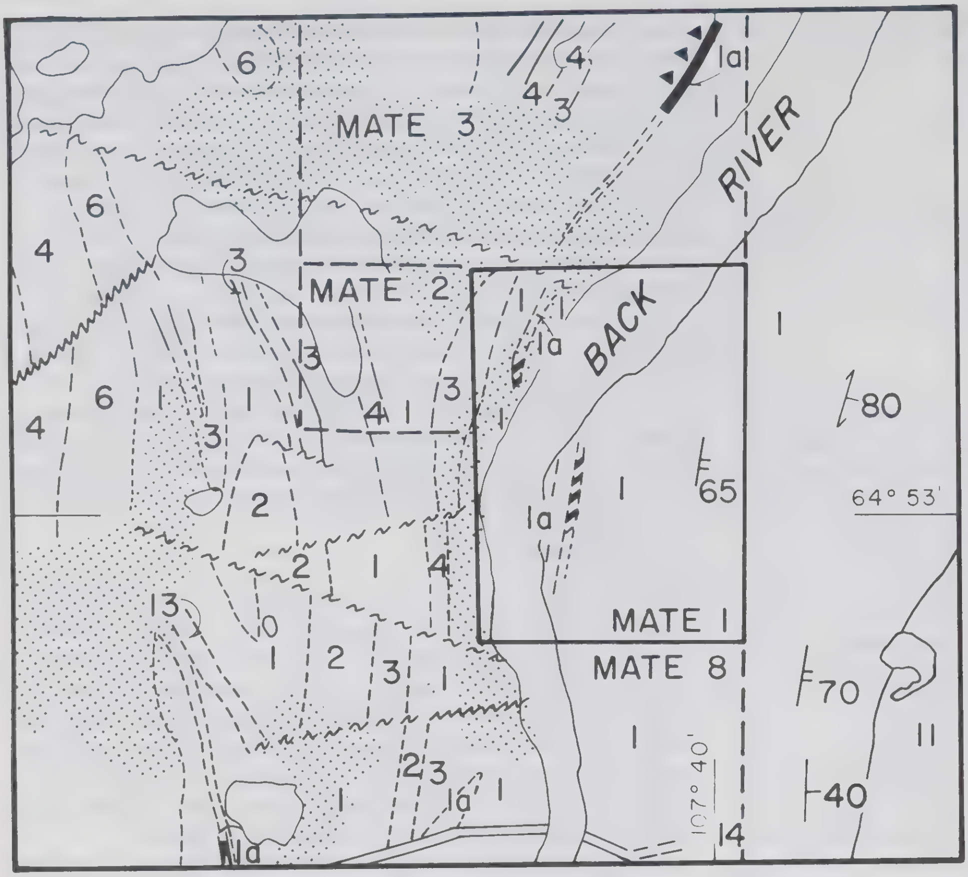
DIAND assessment reports: 080292, 081367, 081854.

PROPERTY

11 GAS claims.

LOCATION

The claims are almost entirely on the west side of the Back River, 425 km northeasterly from Yellowknife (Fig. 8-10).



SYMBOLS

- Major drift-covered area
- Geological boundary (defined, approximate, assumed)
- Fault
- Bedding, top known (inclined)
- Bedding, top unknown (inclined)
- Schistosity, slaty cleavage, clast orientation (tectonic) breccias and conglomerates
- Gossan
- Breccia (impregnated with carbonate)

LEGEND

PROTEROZOIC

14	Meta-gabbro, -diabase; dykes trending northeasterly; age uncertain

REGAN INTRUSIVE SUITE

Biotite-hornblende diorite, -quartz diorite, -quartz monzodiorite; minor granite
11a - plagioclase bearing pyroxene hornblendite

ARCHEAN

YELLOWKNIFE SUPERGROUP

BACK RIVER GROUP

6	Rhyolite, massive, flow layered, brecciated; sparsely porphyritic (quartz, feldspar), white, buff and pale grey weathering rocks; minor tuff; includes rocks of dacite composition; domes, flows, dykes and ring-fracture intrusions; composite dome complexes include massive quartz phyric rhyolite, quartz-volcarenite; breccias commonly impregnated with carbonate
4	Felsic tuffs, breccias, massive units dominantly of dacitic composition; grey, white, pink and pale green weathering rocks containing sparse phenocrysts of quartz and feldspar; may contain part of Unit 5 and rock of rhyolitic composition: volcanic domes, lavas and associated air-fall and ash-flow tuffs; minor conglomerate
3	Andesitic lavas, breccias and volcaniclastic rocks; minor conglomerate
2	Basalt, pillowed and massive lava

BEECHEY LAKE GROUP

1 / 1a	Greywacke-mudstone turbidites, siltstone, grit, minor conglomerate, graphitic shale, tuffaceous sandstones and tuff; rhyolite and dacite boulder paraconglomerate and debris flow deposits adjacent felsic dome complexes 1a - Iron formation, oxide (chert-jasper-hematite), silicate (amphibole) and sulphide (pyrite, pyrrohotite) and carbonate facies

FIGURE 8-9: Geology of the MATE 1, 2, 3, 8 claims (geology simplified from Lambert, 1981).

HISTORY

Cominco staked GAS 1-133 in the fall of 1974 (Seaton, 1978).

In 1975, the claims were mapped at 1:5000 and several EM conductors, without magnetic correlation, were outlined in the southern part of the property.

By 1981, all but nine claims had lapsed. GAS 200 was recorded in August 1983 and GAS 201 in July 1984. Cominco owns other GAS claims in the Back River area, but they are not contiguous with the 11 GAS claims discussed in this section.

The exploration history of the property area has been reviewed by Schiller (1965), Schiller and Hornbrook (1964) and Seaton (1978, 1984).

DESCRIPTION

The claims are underlain by rocks of the Back River Volcanic Complex (Lambert 1978, 1981), and are near the eastern margin of the complex.

CURRENT WORK AND RESULTS

In 1984, three diamond drill holes, on GAS 52, 57 and 201 (Fig. 8-10), tested horizontal loop EM conductors.

GAS CLAIMS (Eastern Block)

Cominco Ltd.	Gold
700-409 Granville St.	76 B/13
Vancouver, B.C., V6C 1T2	64°53'N, 107°42'W

REFERENCES

Lambert (1978, 1981); Wright (1957, 1967).
DIAND assessment report: 081901.

PROPERTY

GAS 300, 400, 500, 600.

LOCATION

The property is 430 km northeasterly from Yellowknife and, with the exception of small parts of GAS 300 and GAS 400, lies on or southeast of the Back River (Fig. 8-10).

HISTORY

GAS 300 was recorded in October 1983, GAS 400 and GAS 500 in April 1984, and GAS 600 in September 1984. The area was prospected by Cominco in the sixties and auriferous iron formation was noted. Little or no further work was done until 1984.

DESCRIPTION

The property is underlain by Yellowknife Supergroup metasediments which are intruded by granodiorite. The metasediments flank the eastern margin of the Back River Volcanic Complex (Lambert, 1978). Iron formation units within the metasediments are locally auriferous.

CURRENT WORK AND RESULTS

In 1984, reconnaissance mapping and sampling delineated units of locally auriferous iron formation. Encouraging gold assays prompted the staking of GAS 400, 500 and 600. In 1985, geological mapping (1:5000 scale) and magnetic and VLF-EM surveys were completed over a grid on GAS 400, 500 and 600 (Fig. 8-10).

MATE 4 CLAIM

Silver Hart Mines Ltd.	Silver, Zinc, Lead
209, 320 Sioux Road	76 B/13
Sherwood Park, Alta., T8A 3X6	64°55'N, 107°47'W

REFERENCES

Lambert (1978, 1981).
DIAND assessment report: 081930.

PROPERTY

MATE 4.

LOCATION

MATE 4 is 425 km northeasterly from Yellowknife and 15 km south of the southern shore of Regan Lake.

HISTORY

MATE 4 was recorded in April 1983 for Silver Hart Mines Ltd.

DESCRIPTION

MATE 4 is on the northern margin of the Back River Volcanic Complex (Lambert, 1978, 1981). It is underlain by rhyolite-dacite of the Back River Group and greywacke-mudstone turbidites of the Beechey Lake Group.

CURRENT WORK AND RESULTS

In 1984, one hole was drilled in the south-central part of the claim. The hole intersected 66 m of rhyolite and, lower in the hole, 26 m of feldspar porphyry with a small amount of quartz.

Rhyolite core samples assayed up to 4.2 g/t Au across 1.5 m, but most assayed less than 2 g/t Au. Feldspar porphyry samples assayed up to 28.6 g/t Ag, with 336 ppm Zn and 56 ppm Pb. The higher assays were associated with disseminated pyrite (up to 1%), with occasional pyrite veinlets and minor carbonate veinlets.

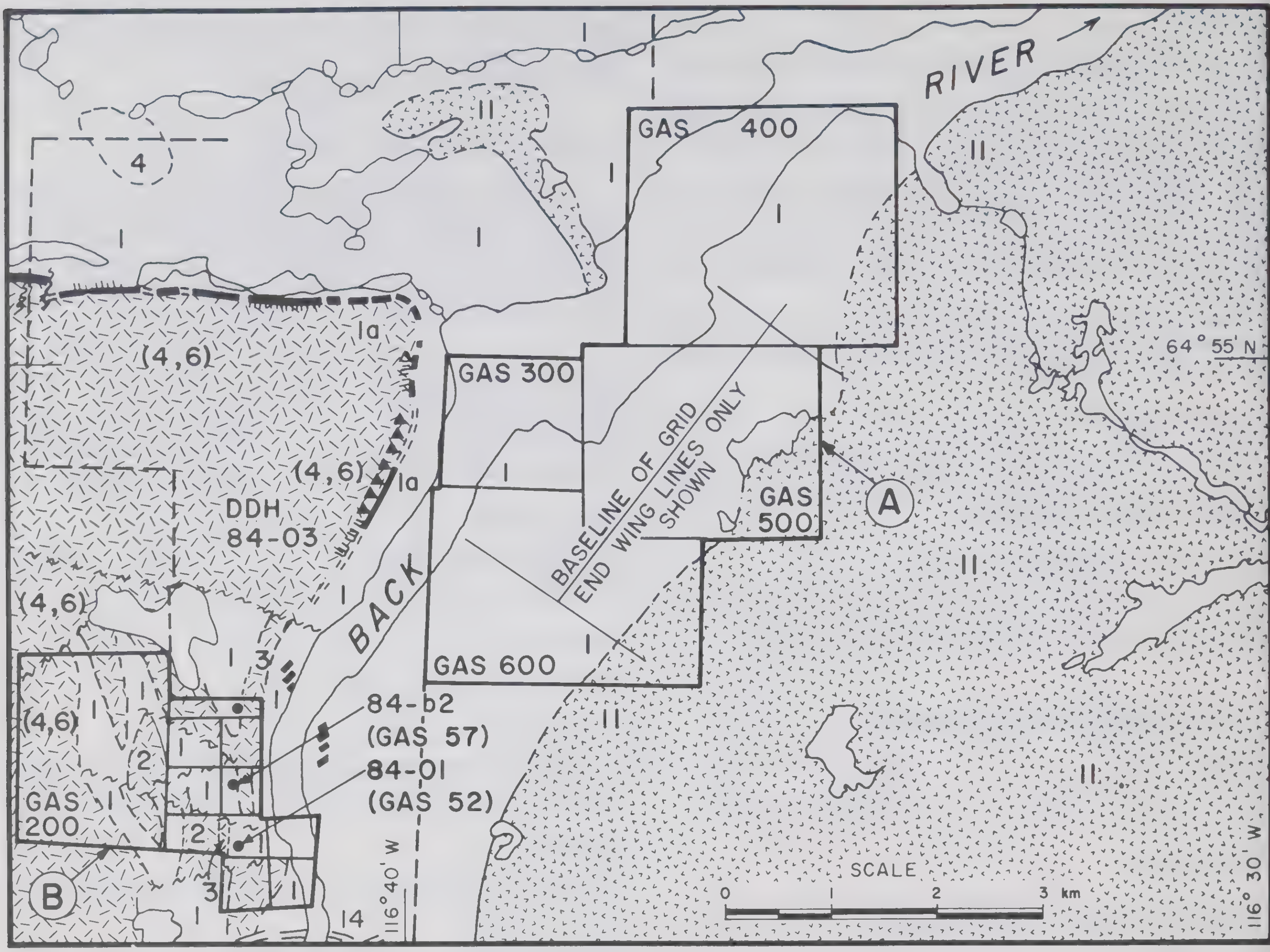


FIGURE 8-10: Geology of the GAS claims; eastern and western blocks (geology simplified from Lambert, 1981).

MATE 5, 10

Silver Hart Mines Ltd.	Gold
209, 320 Sioux Road	76 B/13
Sherwood Park, Alta., T8A 3X6	64°55′N, 107°55′W

REFERENCES

Lambert (1978, 1981).
DIAND assessment report: 081932.

PROPERTY

MATE 5, 10.

LOCATION

The claims are roughly 435 km northeasterly from Yellowknife and largely northwest of the Back River. MATE 5 extends 4 km west of the Back River. MATE 10 adjoins the northern and eastern margins of MATE 5 and extends 2 km west of the Back River.

DESCRIPTION

According to Lambert (1981), the claim area is underlain by Beechey Lake group metasediments, except for a small part southeast of the Back River, which is underlain by part of a pluton of the Regan Intrusive Suite.

CURRENT WORK AND RESULTS

Four holes were diamond drilled in 1984 within an area of a 500 m radius of 64°57′N, 107°32′W; one on MATE 5 and three on MATE 10.

The holes were intended to probe the source of auriferous arsenopyrite-bearing quartz veins and stringers in quartz diorite found in frost-heaved boulders nearby. Quartz-veined diorite was not intersected and core was not assayed.

The holes intersected Beechey Lake Group metasediments and feldspar to feldspar-biotite-quartz porphyry. A diorite sill was intersected across 4.6 m in one hole.

PROTEROZOIC

14	Meta-gabbro, diabase; dykes trending northeasterly, age uncertain

ARCHEAN

REGAN INTRUSIVE SUITE

11	Biotite-hornblende diorite,-quartz diorite, -quartz monzodiorite; minor granite

YELLOWKNIFE SUPERGROUP

BACK RIVER GROUP

6	Rhyolite, massive, flow layered, brecciated; sparsely porphyritic (quartz, feldspar), white, buff and grey weathering rocks; minor tuff, includes rocks of dacite composition; domes, flows, dykes and ring-fracture intrusions; composite dome complexes includemassive quartz phyric rhyolite, quartz-feldspar phyric dacite and associated flanking breccias, conglomerate and volcarenite; breccias commonly impregnated with carbonate
4,6	Units 4 and 6 undivided
4	Felsic tuffs, breccias, massive units dominantly of dacitic composition; grey, white, pink and pale green weathering rocks containing sparse phenocrysts of quartz and feldspar; may contain rocks of rhyolitic composition: volcanic domes, lavas and associated air-fall and ash-flow tuffs; minor conglomerate
3	Andesitic lavas, breccias and volcaniclastic rocks; minor conglomerate
2	Basalt, pillowed and massive lava

BEECHEY LAKE GROUP

1, 1a	Greywacke-mudstone turbidites, siltstone, grit, minor conglomerate, graphitic shale, tuffaceous sandstones and tuff; rhyolite and dacite boulder paraconglomerate and debris flow deposits adjacent felsic dome complexes 1a: - Iron formation, oxide (chert-jasper-hematite), silicate (amphibole) and sulphide (pyrite, pyrrhotite) and carbonate facies These sediments range in metamorphic grade from lower greenschist facies along the eastern and northern sides of the volcanic complex, increasing to amphibolite facies bearing staurolite, cordierite and andalusite near Jim Magrum Lake

Gossan

Breccia (impregnated with carbonate)

Rocks impregnated with carbonate

GAS claims. (A) Eastern block

(B) Western block

DOC, PERU, PU, SIDD AND UL CLAIMS

Noranda Expl. Company Ltd.	Gold
4-2130 Notre Dame Ave.,	76 B/13; 76 G/3,4; 76 F/8
Winnipeg, Man., R3H 0K1	64°59′-65°18′N,
	107°22′-108°15′W

REFERENCES

Frith (1981a); Frith and Percival (1978); Lambert (1978, 1981); Lord (1951); Seaton and Crux(1985).

DIAND assessment reports: 081610, 081789, 081909.

PROPERTY

DOC 1; PERU 1-7; PU 1,2; 19 SIDD claims; UL 1-11.

LOCATION

The claims are 430 to 445 km northeasterly from Yellowknife and extend from the vicinity of Uist Lake to the Back River in a southeasterly direction. They comprise five discrete claim blocks (Fig. 8-11).

HISTORY

Gold was discovered in the area in the mid-forties when the ALGOOD claim group was staked near Regan Lake (Lord, 1951). Additional references to the exploration history are given in Seaton and Crux (1985).

From 1974 to 1980, Noranda Exploration Company Ltd. explored for massive volcanogenic sulphide silver-base metal deposits in the Hackett River Volcanic Belt. In 1981, Noranda was granted Prospecting Permits 811-813 (Seaton and Crux, 1985; DIAND assessment report 081610), which covered 76 G/4 NW, and 76 G/5 SE and SW.

In 1982, during prospecting and reconnaissance geological mapping of Prospecting Permit 811, a zone of auriferous, arsenopyrite-bearing oxide and silicate facies iron formation was discovered between the Algood and Ack showings (Fig. 8-11). SIDD 1-10 (recorded in November 1982) were staked to cover the zone.

In 1983, geological and geophysical surveys and rock sampling resulted in delineation of additional auriferous iron formation, and staking of 37 more claims; 14 of which were staked to cover a zone of iron formation near the northwestern shore of Uist Lake.

Of the claims in good standing in 1984, SIDD 1-10 were recorded in November 1982, SIDD 20-22, 29-34, PERU 1-7 and DOC 1 in August 1983, UL 1-11 in November 1983, and PU 1,2 in August 1984.

During 1984, Noranda held the DOC, PERU, SIDD and UL claims and acted as operator on behalf of the Hackett/Back Joint Venture in which Noranda Exploration Company Ltd., Pez Corona Gold Corporation Ltd. and Ventorex Exploration Ltd. are partners. The Hackett/Back Joint Venture also explored their FT and HR claims during 1984 (Fig. 8-11 and p. 184 of this report).

DESCRIPTION

Geological Survey of Canada open file maps at 1:50,000 (Lambert, 1981) and 1:125,000 (Frith, 1981a) are available for the area.

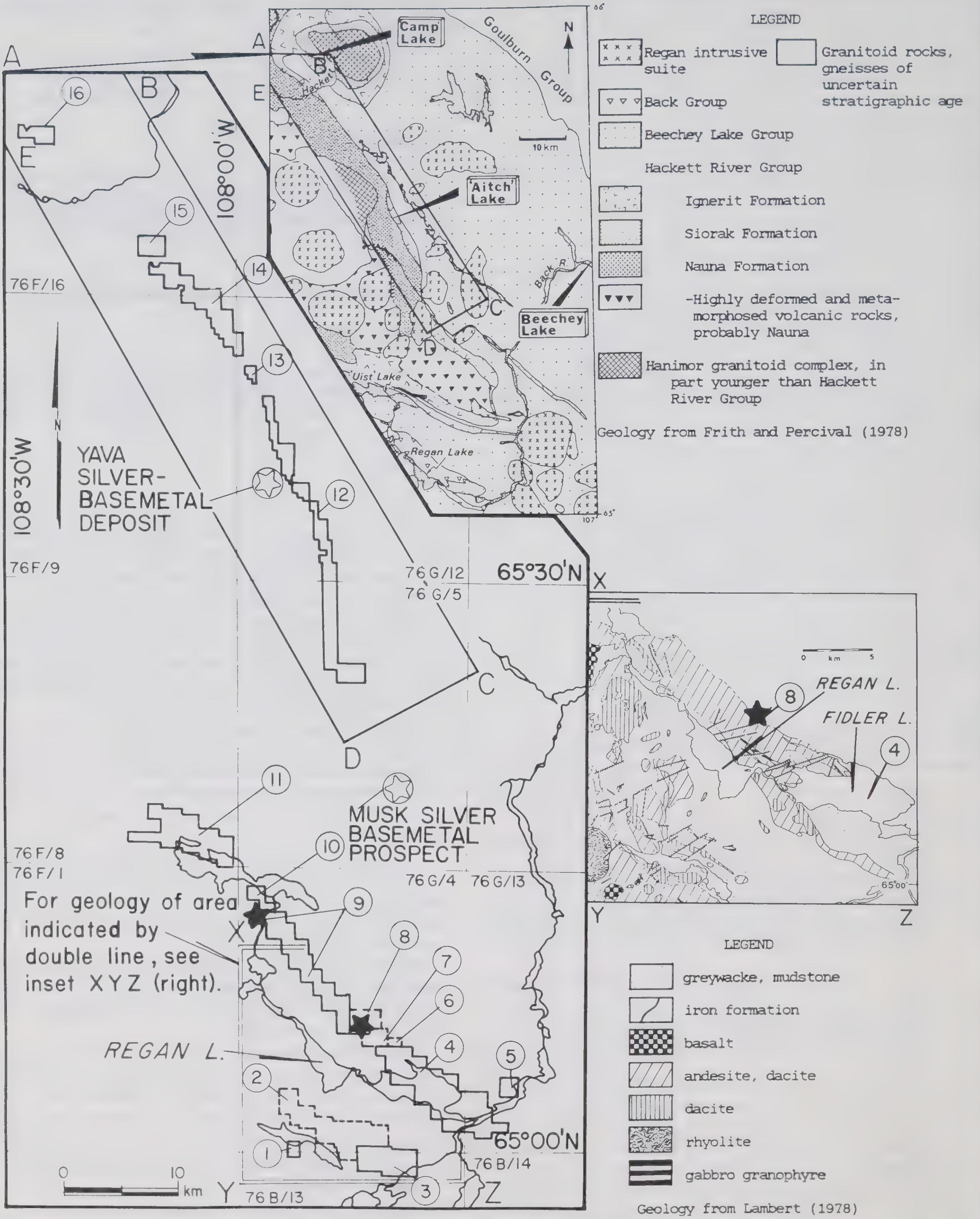


FIGURE 8-11: SIDD, PERU, UL, FT and HR claims. (a) Claim blocks and geology. (b) Grids, Algood and Ack showings and claim block outlines.

CLAIM BLOCKS (1) TO (16) OPPOSITE PAGE

(1) DOC 1

(2) SIDD 12-20 (no reported 1984-1985 work)

(3) SIDD 20-22

(4) PERU 1-4, SIDD 29-32,34 (PERU claims are on S.W. side of block)

(5) SIDD 33

(6) RL 1 (Trigg, Woollett, Olson Consulting, for Back River Joint Venture)

(7) SIDD 11 (not reported)

(8) ALGOOD 1,2 (Giant Yellowknife Mines Ltd.)
☆ Algood gold showing (discovered 1946, first drilled 1948)

(9) SIDD 1-10 (numbers increase northwesterly)
☆ Ack gold showing (drilled by Falconbridge Nickel Mines Ltd. in 1964)

(10) PU 1,2

(11) UL 1-11

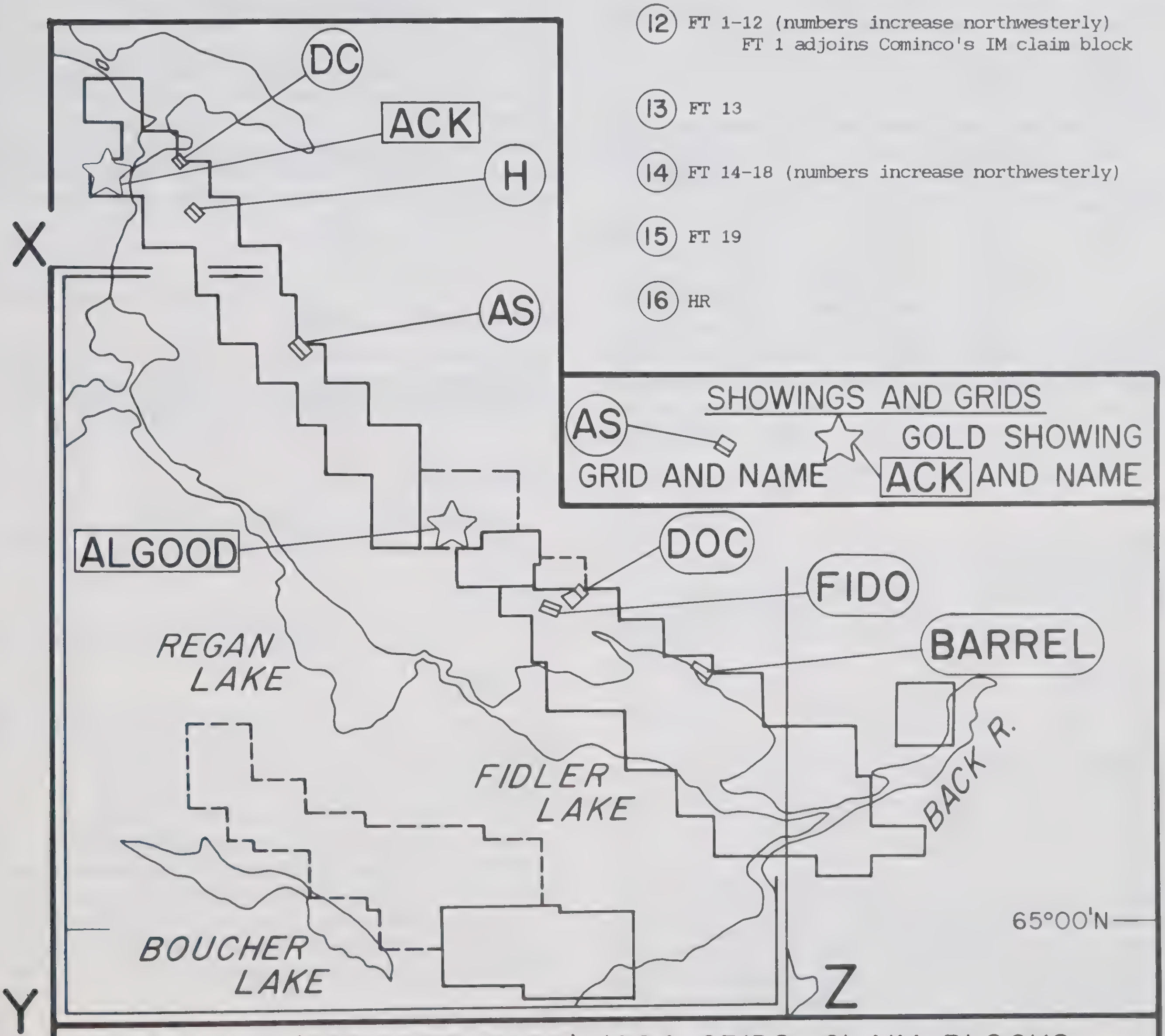
(12) FT 1-12 (numbers increase northwesterly)
FT 1 adjoins Cominco's IM claim block

(13) FT 13

(14) FT 14-18 (numbers increase northwesterly)

(15) FT 19

(16) HR



AREA XYZ (OPPOSITE PAGE) 1984 GRIDS, CLAIM BLOCKS GRIDS, ALGOOD AND ACK GOLD SHOWINGS.

The DOC, PERU and SIDD claims are underlain by andesitic to dacitic volcanics of the Back River Volcanic Complex and Beechey Lake Group metasediments periferal to the volcanics. In the Regan Lake-Fidler Lake area, a tongue of volcanics extends southeasterly from the north end of the Back River Volcanic Complex, and is flanked to the northeast and southwest by Beechey Lake Group metasediments. The metasediments contain lenses and zones of iron formation which is locally auriferous.

The PU and UL claims are underlain by Hackett River Group volcanics of the Ignerit Formation or Beechey Lake Group metasediments marginal to the metavolcanics, which, here also, contain zones of iron formation. On the UL claims, a narrow belt of mafic volcanics is separated from the main body of the Hackett River Group volcanics by a thin layer of graphitic and pyritic metasediments.

CURRENT WORK AND RESULTS

In 1984, geological reconnaissance mapping of the claims led to construction of grids on six target areas (Fig. 8-11). The grids were explored by 1:2,500 geological mapping, magnetic and VLF-EM surveys.

The highest gold assays came from samples taken on the Doc, Fido and H grids. Magnetic anomalies were recorded on all grids but the H and Barrel grids, and VLF-EM conductors were delineated on all but the H grid.

In the DOC 1 and SIDD 20-22 area iron formation is mainly oxide facies, and in the Uist Lake to Fidler Lake area, of silicate and sulphide facies. Gold is generally associated with arsenopyrite, commonly coarse grained, and is concentrated in altered chemical sediments enveloping iron formation and not in the iron formation itself. Gold was found both in the altered chemical sediments and in sulphide-bearing quartz veins cross-cutting such sediments. Less commonly, gold was found in quartz veins cutting unaltered argillite and greywacke.

ALB 1 CLAIM

Silver Hart Mines Ltd.	Gold
209, 320 Sioux Road	76 B/13, 76 G/4
Sherwood Park, Alta., T8A 3X6	65°00'30"N, 107°32'W

REFERENCES

Frith (1981a); Lambert (1978, 1981).

PROPERTY

ALB 1.

LOCATION

ALB 1 is mainly in the southeastern corner of NTS 76 G/4; only the southern margin is in NTS 76 B/13. The claim is 440 km northeasterly from Yellowknife and roughly 1 km south of Fidler Lake. The Back River flows northward through the eastern part of ALB 1. ALB 1 adjoins and lies south of Noranda Exploration Company's PERU 4 (Fig. 8-11).

HISTORY

ALB 1 was recorded for Silver Hart Mines Ltd. in September 1983.

DESCRIPTION

ALB 1, according to Frith (1981), is largely underlain by greywacke of the Beechey Lake Group. Volcanics of the Back River Group underlie the northwestern corner of the claim. The volcanics are described as massive and pillowed andesite, porphyritic andesite and andesitic tuff.

CURRENT WORK AND RESULTS

A total of 185 m, in two holes, was drilled on ALB 1 in 1984. The presumed target was auriferous iron formation. Results of this drilling have not been reported.

BEECHEY LAKE BASIN

The term "Beechey Lake Basin" is used in this report to denote the large area of deposition of metasedimentary rocks centred at Beechey Lake. Metamorphic grade increases northwesterly and southeasterly towards the Thelon Front, away from the northwestern end of Beechey Lake. The Beechey Lake Basin adjoins the Hackett River Volcanic Belt (Frith, 1981a,b).

FT AND HR CLAIMS

Noranda Expl. Company Ltd.	Gold
4-2130 Notre Dame Ave.	76 F/16; 76 G/5,12
Winnipeg, Man., R3H 0K1	65°24'-65°48'N, 107°44'-108°07'W

REFERENCES

Frith (1981a); Frith and Percival (1978).
DIAND assessment report: 081909.

PROPERTY

FT 1-19; HR 1.

LOCATION

The claims are roughly 475 km northeasterly from Yellowknife.

HISTORY

The FT and HR claims were recorded in November 1983, by Noranda Exploration Company. They were explored in 1984 as part of the Hackett/Back Joint Venture, in which Noranda Exploration Company Ltd., Pez Corona Gold Corporation Ltd. and Ventorex Exploration Ltd. are partners and for which Noranda acted as operator.

DESCRIPTION

The claims (Fig. 8-11) are along the northeastern margin of the Hackett River Volcanic Belt, which in this area com-

prises rocks of the Nauna and Ignerit Formations (Fig. 8-11; Frith, 1981a; Frith and Percival, 1978). The volcanics are flanked to the northeast by argillites and greywackes of the Beechey Lake Group. Within the Beechey Lake Group, near its contact with the Hackett River Volcanic Belt, are several thin units of chert-amphibole-magnetite iron formation.

CURRENT WORK AND RESULTS

A gossan that discontinously follows the margin of the Hackett River Volcanic Belt was prospected. The gossan caps pyritic chlorite schists and iron-bearing carbonate rock in felsic volcanics near their contact with metasediments of the Beechey Lake Group. Grab samples from the gossan assayed less than 3.5 g/t Au, as did grab samples of the Beechey Lake Group iron formations.

In addition to magnetite and chert beds, actinolite-tremolite amphiboles were found in layers between magnetite. Magnetite layers contain laths and radiating aggregates of grunerite. Arsenopyrite is rare but disseminated pyrite is found in the chert bands of the iron formation and in associated chlorite schists (DIAND assessment report 081909).

PROSPECTING PERMITS 1042, 1043

Back River Joint Venture	Gold
c/o Trigg, Woollett, Olson	76 G/3
Consulting Ltd.	65°00'-65°15'N
10504-103 St.	107°00'- 107°30'W
Edmonton, Alta., T5H 2V4	

REFERENCES

Frith (1981a,b); Gibbins and others (1977); Seaton (1978).
DIAND assessment reports: 061343, 061344, 061392, 081975.

PROPERTY

Prospecting Permits 1042, 1043.

LOCATION

The permits lie 460 km northeasterly from Yellowknife. Permit 1043 is 1 km west of Casey Lake.

HISTORY

Du Pont of Canada Exploration Ltd., in 1974-75, explored NTS quadrants 76 G/2 and 76 G/3 as Prospecting Permits 328 and 329 respectively (DIAND assessment reports 061343, 061344, 061392; Gibbins and others, 1977; Seaton, 1978). Du Pont's main target was argentiferous base metal, volcanogenic, massive sulphides, but in the course of exploration, a gold showing was discovered (see BEE 1-3 claim, page of this report).

In 1983, Trigg, Woollett, Olson Consulting, as operators for Back River Joint Venture, prospected and rock sampled parts of 76 G/3 NW and SE.

MR 1 was recorded in September 1984 and Prospecting Permits 1042, 1043 were granted on February 1, 1985.

DESCRIPTION

The regional geology of the area has been mapped and compiled by Frith, 1981a,b.

Much of the permit area is underlain by Beechey Lake Group metasediments and granitoids (Fig. 8-12). A small part of Prospecting Permit 1042 is underlain by volcanics of the Hackett River Group and, a yet smaller part, by a narrow belt of Back Group volcanics.

Cominco's Prospecting Permits 1053-1055 adjoin Prospecting Permits 1042 and 1043.

CURRENT WORK AND RESULTS

In 1984, Prospecting Permits 1042 and 1043 were explored by reconnaissance prospecting, rock sampling and geological mapping at 1:10,000 scale. MR 1 was staked in 1984.

In 1985, exploration was confined to Prospecting Permit 1043 and comprised prospecting, rock sampling and geological mapping at 1:10,000.

BEE CLAIMS AND PROSPECTING PERMITS 1053, 1054, 1055

Cominco Ltd.	Gold
700, 409 Granville St.	76 G/3,6
Vancouver, B.C.,	65°15'N, 107°15'W
V6C 1T2	

REFERENCES

Allen, Cameron and Durham (1972); Frith (1981a,b); Gibbins and others (1977); Seaton (1978); Tremblay (1971).
DIAND assessment reports: 061343, 081937, 081969.

PROPERTY

BEE 1-3; Prospecting Permits 1053, 1054, 1055.

LOCATION

The permit area is roughly 470 km northeasterly from Yellowknife. Prospecting Permit 1054 (76 G/6 SW) straddles the Back River. Permit 1053 (76 G/6 SE) lies directly north of Prospecting Permit 1055 (76 G/3 NE), which encloses BEE 1-3.

HISTORY

Du Pont of Canada Exploration Ltd. explored NTS 76 G/3 as Prospecting Permit 329, in 1974 (Gibbins and others, 1977; Seaton, 1978; and DIAND assessment report 081343). The target was mainly silver-base metal volcanogenic massive sulphides and the work was prompted in part by the delineation of geochemical anomalies by Allen, Cameron and Durham (1972). Du Pont discovered a gold showing in sericitic schist, now covered by the BEE claims.

BEE 1-3 were recorded in August 1985. Prospecting Permits 1053 to 1055 were granted in 1985.

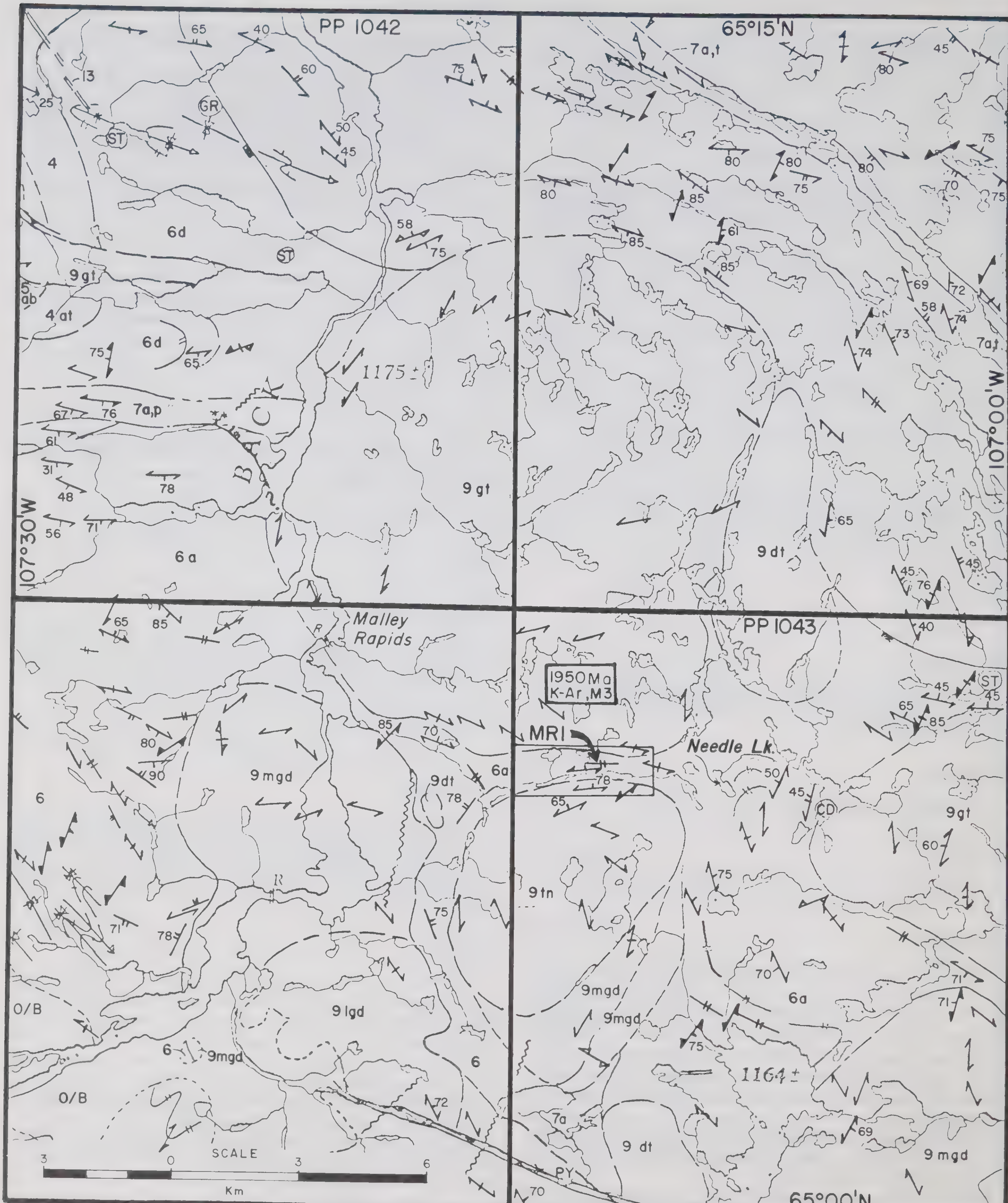


FIGURE 8-12: Geology of the Prospecting Permits 1042 and 1043 (geology from Frith, 1981a).

LEGEND

QUATERNARY

O/B	Sand and gravel.

ARCHEAN

REGAN INTRUSIVE SUITE

9gt	Granite
9lgd	Leucogranodiorite
9dt	Diorite, quartz diorite

YELLOWKNIFE SUPERGROUP

BACK GROUP

7	7a, massive and pillowed andesite, porphyritic andesite and andesitic tuff.

BEECHEY LAKE GROUP

6	6, undifferentiated greywacke, mudstone, carbonaceous shale; 6a, greywacke; 6b, mudstone; 6c, carbonaceous mudstone; 6d, porphyroblastic gneiss and schist derived from 6a-6c; 6e, locally migmatitic rocks derived from 6a-6c.

HACKETT RIVER GROUP

4	IGNERIT FORMATION: felsic and basic flows, fragmental volcanics, volcanic sediments, iron formation, chert, sulphide-rich zones; 4a, dacite, dacitic tuff; 4b, andesite, basalt, tuff; 4c, carbonate with dacitic fragmental rocks.

SYMBOLS

Geological boundary (defined, approximate, assumed)

Bedding (tops known, overturned, tops unknown)

Bedding trends (dip unknown, tops unknown, tops known)

Bedding-cleavage:
S_1 (top known: inclined, vertical, overturned)
(top unknown: inclined, vertical, dip unknown)

Axial planar foliation:
S_1 (dip inclined, vertical, unknown)
S_2
S_3

Lineation:
L_1 (mineral, minor fold axis, warp axis, clast elongation)
L_2

Antiform, synform with plunge:
F_1
F_2

high / low — Biotite isograd

high / low — Staurolite-cordierite isograd

Sulphide-rich strata

t — Tuffaceous rock (eg. 7b,t=unit 7, basaltic tuff)

p — Pillowed (eg. 7b,p=unit 7, pillow basalt)

ST — Staurolite

DESCRIPTION

The regional geology was compiled by Frith (1981a,b). The prospecting permits are mainly underlain by Archean Beechey Lake Group metasediments; greywacke-mudstone turbidites and their metamorphic derivatives (Fig. 8-13). A unit of mafic flows and tuffs, in part carbonate-rich, strikes northwesterly through Prospecting Permit 1055 and BEE 1-3, the southwestern corner of Prospecting Permit 1053 and Permit 1054. Felsic volcanics of the Ignerit Formation underlie the southwestern corner of Prospecting Permit 1054. These felsic volcanics are rimmed by a thin, roughly 100 m thick unit of limestone, which is in contact to the east with Beechey Lake Group metasediments.

Granite underlies the southwestern third of Prospecting Permit 1055 and a 3 km wide stock of leucogranodiorite underlies part of the southeastern quarter of Permit 1053.

Most of the permit area is underlain by metamorphic facies between the biotite isograd and the staurolite-cordierite isograd. Rocks in the northeastern corner of Permit 1053 are on the low grade side of the biotite isograd and porphyroblastic gneisses and schists in the western part of Permit 1054 are on the high grade side of the staurolite-cordierite isograd.

CURRENT WORK AND RESULTS

In 1985, the prospecting permits and BEE claims were mapped. A 4000 by 1000 m grid was constructed on BEE 1. The grid was explored by detailed geological mapping, rock sampling and magnetic and VLF-EM surveys. Rock samples from the three permits and from the BEE 1 grid were analyzed for gold. Four trenches were excavated and sampled for gold, one at the eastern end of the grid and three roughly 1300 m west-northwesterly from trench 1.

IM CLAIMS

Cominco Ltd.	Gold
700-409 Granville St.	76 G/5
Vancouver, B.C., V6C 1T2	65°23′N, 107°41′W

REFERENCES

Frith (1981a); Seaton (1978).
DIAND assessment reports: 080451, 080576, 081970.

PROPERTY

IM 1-3,6-8.

LOCATION

The claims are 460 km northeasterly from Yellowknife and 28 km southeasterly from the Yava massive sulphide deposit.

HISTORY

IM 1-3 and 6-8 were recorded for Cominco Ltd.; IM 1 in July 1984 and IM 2-3 and 6-8 in October 1985. They cover part of ground staked in 1974 for Precambrian Mining Services Ltd. as IM 1-38. This was acquired in 1975 by the Yava Syndicate which comprised Brascan Resources Ltd., Conwest Exploration Ltd. and S. Roscoe. The main target of the Yava Syndicate was volcanogenic silver-base metal deposits, but in the course of exploration (DIAND assessment reports 080451, 080576 and Seaton, 1978) they discovered auriferous iron formation showings south of Triangle Lake (Fig. 8-14). Two trenches were excavated to explore this gold showing.

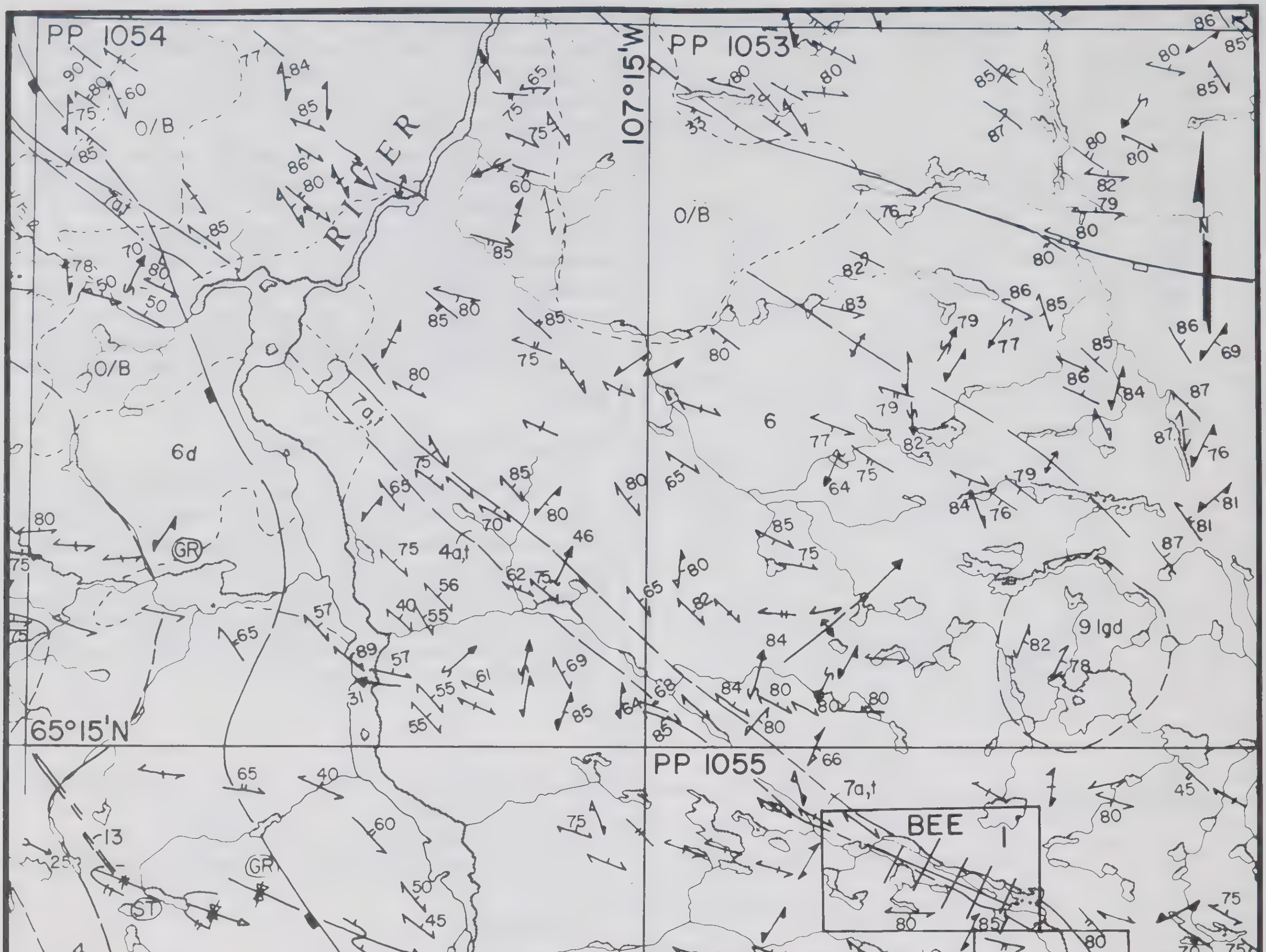


FIGURE 8-13: Geology of the BEE claims and Prospecting Permits 1053-1055 (geology from Frith, 1981a).

LEGEND

QUATERNARY

O/B	Glacial till. Sand, gravel

HELIKIAN

13	Mackenzie diabase dykes

ARCHEAN

REGAN INTRUSIVE SUITE

9gt	Granite
9lgd	Leucogranodiorite
9mgd	Melanogranodiorite
9gd	Granodiorite, undifferentiated
9tn	Tonalite
9dt	Diorite, quartz diorite

YELLOWKNIFE SUPERGROUP

BACK GROUP

7	7a, massive and pillowed andesite, porphyritic andesite and andesetic tuff

BEECHEY LAKE GROUP

6	6, undifferentiated greywacke, mudstone, carbonaceous shale; 6a, greywacke; 6b, mudstone; 6c, carbonaceous mudstone; 6d, porphyroblastic gneiss and schist derived from 6a-6c; 6e, locally derived migmatitic rocks derived from 6a-6c

HACKETT RIVER GROUP

5	Metamorphosed and deformed equivalents of unit 3 (Nauna Formation volcanics) and unit 4; 5a, dacite; 5b, andesite and/or basalt
4	IGNERIT FORMATION: felsic and mafic flows, fragmental volcanics, volcanic sediments, iron formation, chert, sulphide-rich zones; 4a, dacite, dacitic tuff

SYMBOLS

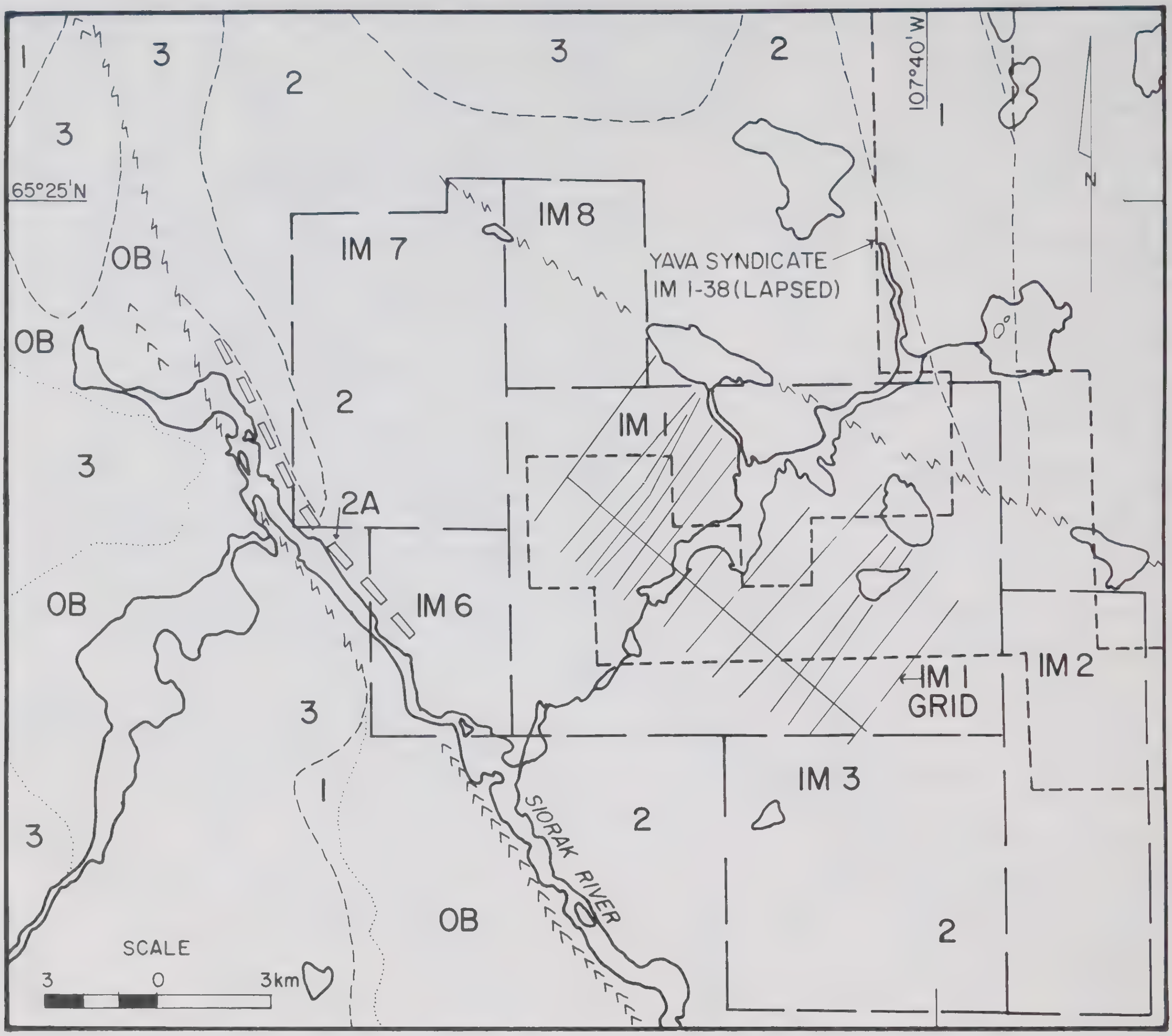
	Geological boundary (defined, approximate, assumed)
	Bedding (tops known, overturned, unknown)
	Bedding trends (dips unknown, tops unknown, tops known)
	Bedding - cleavage: S_1 (top known: inclined, vertical, overturned) (top unknown: inclined, vertical, dip unknown)
	S_1 Axial planar foliation S_2 (dip inclined, vertical, S_3 unknown)
	Lineation - L1 (mineral, minor fold axis, warp axis, clast elongation)
	Fault (defined, approximate)
HIGH LOW	Staurolite-cordierite isograd
	Sulphide-rich strata
GR	Garnet
ST	Staurolite
t	Tuffaceous (eg. 7b,t = unit 7, basaltic tuff)
p	Pillowed (eg. 7b,p = unit 7, pillow basalt)

DESCRIPTION

The regional geology has been compiled by Frith (1981a). The claims are mainly underlain by biotite gneisses and schists of the Yellowknife Supergroup, which are probably derived from greywacke-mudstone turbidites. The extreme northeastern corner of IM 1 is underlain by felsic agglomerate (DIAND assessment report 080576). The claims are a few kilometres east of the Hackett River Volcanic Belt. Amphibolitic iron formation is interbedded with Beechey Lake Group metasediments of the Yellowknife Supergroup.

CURRENT WORK AND RESULTS

A grid, with a 2.4 km long northwesterly base line and winglines averaging about 1.5 km, was constructed on IM 1. The IM 1 grid was explored during the summer of 1985 by geological mapping and rock sampling, magnetic and VLF-EM



LEGEND

QUATERNARY

OB Glacial and post-glacial deposits. <<<< Eskers.

ARCHEAN

3 Granite.

BEECHEY LAKE GROUP

2 Porphyroblastic gneiss and schist derived from greywacke-mudstone turbidites. 2a, iron formation from Frith (1981a). Iron formation units mapped by Cominco Ltd. on IM 1 Grid are not shown.

HACKETT RIVER AND BACK GROUPS

1 Undivided mafic to felsic volcanics. The Hackett River Group (exposed in the southwestern and western part of the map area) includes the Nauna Formation and Ignerit Formation. The Back River Group volcanics are younger than the Hackett River Group and outcrop north of claim IM 1.

FIGURE 8-14: Geology of the IM claims and grid location (geology simplified from Frith, 1981a).

surveys and by excavation of four trenches: three in the western part of the grid; one near "Triangle Lake" (Fig. 8-14) in the eastern corner.

RL 1 CLAIM

Back River Joint Venture	Gold
c/o Trigg, Woollett, Olson	76 G/4
Consulting Ltd.	65º05′N, 107º36′W
10504-103 St.	
Edmonton, Alta., T5H 2V4	

REFERENCES

Frith (1981a); Frith and Hill (1975); Frith and Percival (1978); Lambert (1978, 1981); Lord (1951); Schiller and Hornbrook (1964); Seaton (1984); Seaton and Crux (1985).

DIAND assessment reports: 017157, 017160, 081812.

PROPERTY

RL 1.

LOCATION

The claim is on the north shore of Fidler Lake (3 km east of Regan Lake), and 440 km northeasterly from Yellowknife (Fig. 8-15).

HISTORY

The first recorded exploration for gold in the Regan Lake area is by Don Cameron Exploration Ltd. In 1946, they staked ALGOOD 1-24, MAKRAK 1-17 and 5 other claims as one block and the GOODAL and RUSIN claims as a second discrete block (DIAND assessment report 017160). Algood Gold Mines Ltd. was incorporated in January 1947 to acquire the ALGOOD and MAKRAK claims. Exploration, including drilling, done by Don Cameron Exploration Ltd. for Algood Gold Mines is summarized in Lord (1951). The western part of the RUSIN group to the eastern margin of the MAKRAK group are now covered by RL 1. The ALGOOD claims, where most of the work in 1946 and 1947 was concentrated, were centred about 5 km northwesterly from the centre of the present RL 1 claim and lay west of the MAKRAK group.

Work in 1963 and 1964 in the Regan Lake area, on the DON and SAM claims, by Falconbridge Nickel Mines Ltd. is summarized by Schiller and Hornbrook (1964) and Schiller (1965). In 1979 and 1980, Giant Yellowknife Mines Ltd. restaked the Algood property as ALGOOD 1 and 2. Exploration of these claims in 1980-81 included diamond drilling.

During 1982, 1983 and 1984, Noranda Exploration Company Ltd. staked a 30 km long belt of claims, mainly on ground explored as Prospecting Permit 811 (Seaton and Crux, 1985). The belt, which is segmented by the ALGOOD claims, covers a volcanic-sediment contact that trends northwesterly from Fidler Lake. The belt of Noranda claims is indented on its northeastern side by RL 1 and comprises the SIDD, PERU and PU claims. It extends southeast of Regan Lake over largely metasedimentary terrane to meet the area staked by Silver Hart Mines Ltd. and others along the Back River (Fig. 8-15).

Gold hosted by metamorphosed amphibolitic and sulphidic iron formation in Yellowknife Supergroup metasediments has been a major target of companies operating in this area during the early eighties.

DESCRIPTION

The regional geology has been compiled at 1:250,000 by Frith (1981a) and at 1:50,000 by Lambert (1981), who mapped the Back River Volcanic Complex. RL 1 is mainly underlain by metasediments of the Beechey Lake Group of the Yellowknife Supergroup. The metasediments are close to, but on the low grade side of, the biotite isograd (Frith, 1981a).

RL 1 is near the southeastern extremity of a tongue of mainly andesitic volcanics which connects to the northwest and west with the main body of the Back River Volcanic Complex (Lambert 1978, 1981). Five small areas in the northern and western parts of the claim are underlain by lenses of intermediate to felsic agglomerate (DIAND assessment report 081812).

Frith (1981a) has mapped a zone of sulphide-rich strata within metasediments extending from Fidler Lake northwesterly to Uist Lake. This zone is coincident with a thin unit of oxide-silicate iron formation in the southwestern part of RL 1 and the gold showing on ALGOOD 1 to the northwest.

CURRENT WORK AND RESULTS

In 1984, work comprised preparation of a 1:10,000 geological map of RL 1, and 1:1000 geological mapping and magnetic surveys of two small (200 by 80 m) grids.

Grey to black, fine-grained greywacke, interbedded with and grading into mudstone, is the predominant rock type mapped, with local thin units of black mudstone and metamorphic equivalents and minor interbedded greywacke.

BEECHY LAKE NORTH PROJECT

Back River Joint Venture	Gold
c/o Trigg, Woollett, Olson	
Consulting Ltd.	76 G/9-11,13-16
10504-103 St.	76 J/14
Edmonton, Alta., T5H 2V4	65º30′-66º07′30″N
106º15′-107º45′W	

REERENCES

Frith (1981a,b,c); Seaton (1984); Seaton and Crux (1985).

DIAND assessment reports: 081705, 081813, 081822, 081975.

PROPERTY

Prospecting Permits 973, 1014-1017, 1032-1041; BRAU 1-9, LAB 1, SO 1.

LOCATION

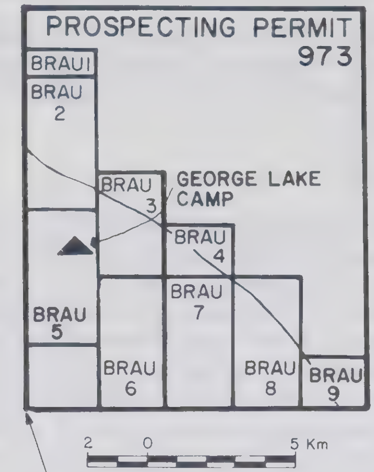
The property (Fig. 8-15) here described under the caption Beechey Lake North Project consists of a single block of prospecting permits and claims that lie from 500 to 560 km northeasterly from Yellowknife and extend 105 km in a northwesterly direction. The southwestern corner of the property is at the northern end of Beechey Lake.

Beechey Lake North Project properties, constituting the major part of the Back River Joint Venture property, are scattered through a wide tract of the eastern Slave Province and includes BR 1, RL 1, WL 1, and Prospecting Permits 1042 and 1043 and MR 1.

HISTORY

Trigg, Woollett, Olson Consulting Ltd. has acted as manager of the Back River Joint Venture since its inception.

During the seventies several companies explored the Proterozoic rocks of the Bathurst Inlet area and the Proterozoic-Archean unconformity for uranium. In 1979, areas later held by Trigg, Woollett, Olson Consulting Ltd. as Prospecting Permits 973, 1016 and 1035, were held and explored for uranium by Urangesellschaft Canada Ltd. as Prospecting Permits 740, 739 and 742 respectively (Seaton, 1984).



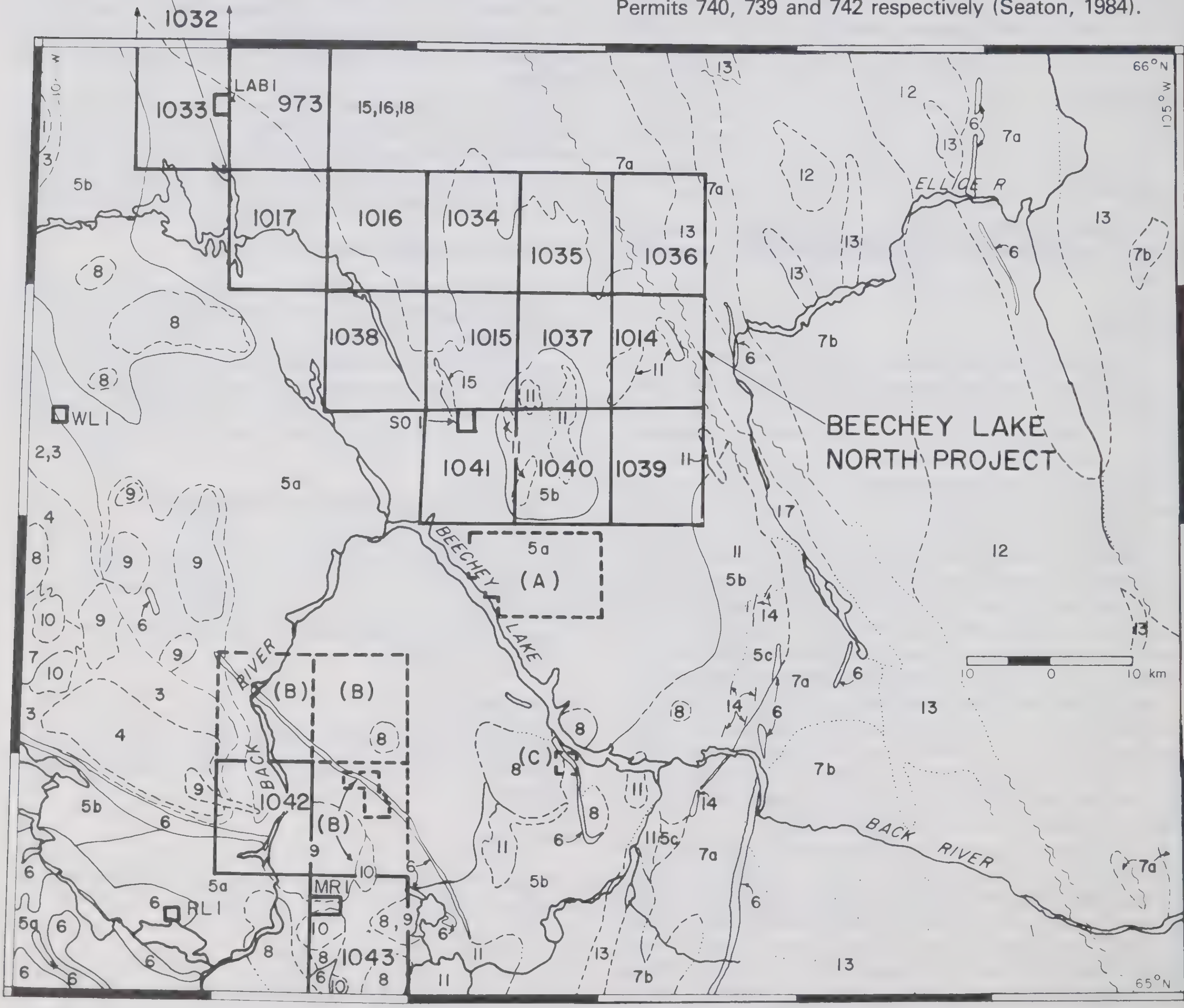


FIGURE 8-15: Geology of the Beechey Lake area: Prospecting Permits 973, 1014-1017 and 1032-1043 (geology modified from Frith, 1981a,b,c). NOTE: Other claims and permits (A) Bow Valley, (B) Cominco Ltd., (C) Kidd Creek Mines Ltd. shown with dashed outline. Claims other than those of Back River Joint Venture not shown west of 107° 30′W.

LEGEND

PROTEROZOIC	18	Gabbro
	17	Ellice River Fm: conglomerate, arkose, shale, sandstone, carbonate
	16	Burnside River Fm: pink quartzite, conglomerate, sandstone, shale, slate
	15	Western River Fm: greywacke, argillite, sandstone, carbonate, conglomerate
AGE UNCERTAIN	14	Pegmatite
	13	Gneiss and migmatite of uncertain origin, includes amphibolite, dioritic, and mylonitic granitized rocks
ARCHEAN	12	Augen K-feldspar gneiss, predominantly granodioritic
	11	Biotite muscovite granite
	8–10	REGAN INTRUSIVE SUITE
	10	tonalite, diorite, quartz diorite
	9	granite
	8	granodiorite
	7	Migmatitic gneiss and migmatite (probably derived from Yellowknife Supergroup)
	7a	biotite gneisses with 10-50% leucosomes
	7b	migmatite with more than 50% leucosomes
	6	Back Group: andesite, basalt and dacite flows, breccia and tuff
	5	BEECHEY LAKE GROUP
	5a	greywacke, mudstone, carbonaceous mudstone
	5b	prophyroblastic gneiss and schist derived from 5a
	5c	biotite gneiss with no porphyroblasts
	1–4	HACKETT RIVER GROUP
	4	dacite, metamorphosed, deformed
	3	felsic and basic flows, fragmental volcanics, volcanic sediments, iron formation
	2	andesite, basalt and dacite flows and fragmentals
	1	biotite-chlorite schist, sericitic schist, mafic amphibole gneiss and quartzofeldspathic gneiss derived from volcanogenic sediments

Trigg, Woollett, Olson Consulting Ltd. acquired Prospecting Permit 973 on February 1, 1983 following 1982 reconnaissance. Permits 1014-1017 were acquired in February 1984 and Permits 1032-1041 in February 1985. LAB 1 and SO 1 were recorded in September 1984.

BRAU 1-9 were recorded for Trigg, Woollett, Olson Consulting Ltd. in October 1985 to cover part of the area previously held as Prospecting Permit 973.

Work done on Prospecting Permit 973 in 1983 is summarized in Seaton and Crux (1985) and recorded in DIAND assessment report 081705. Prospecting Permit 973 expired in February 1986.

DESCRIPTION

Roughly 75% of the area covered by the Beechey Lake North Project is underlain by Archean metasediments of the Beechey Lake Group, comprising greywacke, mudstone, carbonaceous mudstone, iron formation or their metamorphic derivative gneisses and schists (Fig. 8-15). Roughly two-thirds of the Archean metasediments are on the low grade side of the biotite isograd. Only about 10% of the permit area is underlain by metasediments on the high grade side of the staurolite-cordierite isograd (Frith, 1981a,b). The largest area of such rocks surrounds three biotite-muscovite granite stocks (Frith, 1981c), mainly on Prospecting Permits 1037 and 1040. In the southeast corner of the project area, on Permit 1039, the regional metamorphic gradient increases southeasterly towards the Thelon Front. An increase in metamorphic grade is also apparent at the northwestern margin of Prospecting Permit 1033, north of Index Lake, where several granodiorite plutons are exposed within an area of higher grade metasediments (Fig. 8-15).

The Archean metasediments of the project area are isoclinally folded and have a dominant northwesterly structural grain, as indicated by bedding and S1 cleavages. An anomalous west-northwesterly strike of bedding exists in the southern part of Prospecting Permit 1014.

Ten of the fifteen prospecting permits of the Beechey Lake North Project are underlain, to varying extents, by Goulburn Group Proterozoic sediments of the Western River Formation, and more extensively, the Burnside River Formation. Prospecting Permit 1032 is underlain almost entirely by Proterozoic rocks.

CURRENT WORK AND RESULTS

During 1984 and 1985 Back River Joint Venture continued exploring the property with auriferous iron formation as the essential target.

In 1984, Back River Joint Venture resumed exploration of Prospecting Permit 973, and explored the newly acquired Prospecting Permits 1014-1017 (DIAND assessment reports 081813, 081822). An aeromagnetic expression extends southeasterly from Prospecting Permit 973 continues beneath Proterozoic cover rocks, to emerge in Prospecting Permit 1015. Exploration during 1984 comprised one or more of the following: reconnaissance prospecting, grid construction, detailed geological mapping at 1:100 or 1:1000, ground magnetic and VLF-EM surveys, overburden stripping and trenching, grab

sampling, rock chip and rock channel sampling. The surveys were done at selected localities. Reconnaissance prospecting and 1:10,000 geological mapping were carried out along traverses spaced at 500 m intervals on Prospecting Permits 973, 1017 and 1016, as well as on selected parts of Prospecting Permit 1015. A geophysical orientation survey was completed.

Prospecting Permit 1014 is non-contiguous with the block formed by Prospecting Permits 973 and 1015-1017, and was reported separately (DIAND assessment report 081813). Subsequently, with the acquisition of Permits 1032-1041 in 1985, it became part of the single block constituting the Beechey Lake North Project area (Fig. 8-15).

Work on Prospecting Permit 1014, during 1984, comprised prospecting and 1:10,000 geological mapping, grid construction, and 1:1000 geological mapping, magnetic and VLF-EM surveys.

The Prospecting Permits and claims included in the Beechey Lake North Project constitute roughly 82% of the Back River Joint Venture property.

Expenditures reported as assessment on the Back River Joint Venture property have increased roughly eleven-fold since 1983 and about eighteen times as much ground was held in 1985 as in 1983. Most of these increases in expenditure and ground held have been in the Beechey Lake North Project area.

WL 1 CLAIM

Back River Joint Vent.	Gold
c/o Trigg, Woollett, Olson	76 G/12
Consulting Ltd.	65º35'30"N,
10504-103 St.	107º52'30"W
Edmonton, Alta., T5H 2V4	

REFERENCES

Frith (1981a); Frith and Percival (1978); Seaton (1978). DIAND assessment report: 081811.

PROPERTY

WL 1.

LOCATION

WL 1 is near Friday ("Aitch") Lake, roughly 450 km northeasterly from Yellowknife and 3 km southeasterly from the Yava massive sulphide deposit (Seaton, 1978).

HISTORY

Though the Hackett River Volcanic Belt, the margin of which passes within 100 m of the southwestern corner of WL 1, was heavily staked during a base metal exploration surge in the seventies, the WL property has not been staked previously.

WL 1 was recorded in September 1982 after prospecting and rock sampling.

DESCRIPTION

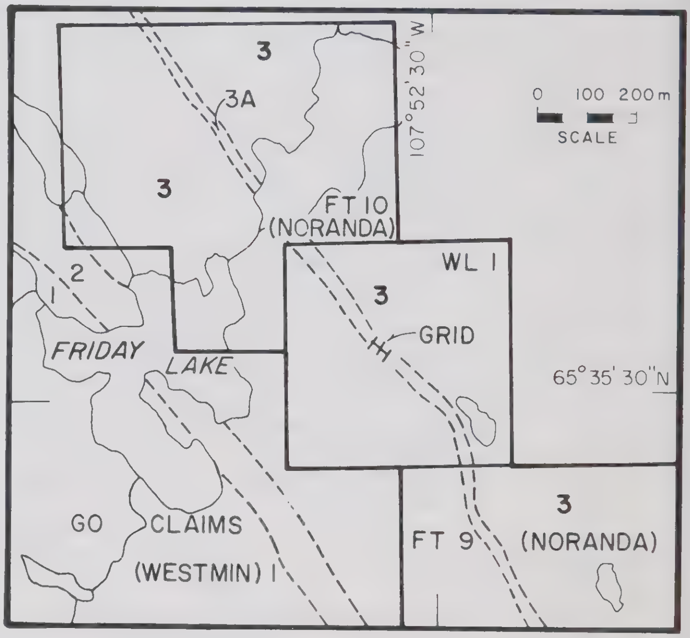
WL 1 is underlain by Beechey Group metasediments, which include a 50 to 75 m wide unit of iron formation. The iron formation strikes northeasterly across the claim.

Northeast and southwest of the iron formation are mudstones with minor interbedded greywackes. The metasediments generally young to the northeast away from volcanics (Fig. 8-16), with some local reversals caused by folding.

The Beechey Lake Group sediments underlying WL 1 are on the high grade side of the biotite isograd, and the low grade side of the staurolite-cordierite isograd (Frith, 1981).

CURRENT WORK AND RESULTS

In 1984, WL 1 was geologically mapped at 1:1000 and prospected. An 80 by 60 m grid was constructed, roughly in the centre of WL 1. The grid was explored by detailed geological mapping and magnetic and VLF-EM surveying. A trench, excavated in the central part of the grid, was mapped and sampled.



LEGEND

BEECHEY GROUP

3	Mudstone with minor interbedded greywacke. 3A Mainly oxide facies iron formation; interbedded magnetite and chert.

HACKETT RIVER GROUP

2	Ignerit Formation: felsic to mafic volcanic rocks, carbonate-cemented volcanic rocks, chert.
1	Nauna Formation: felsic volcanic rocks

FIGURE 8-16: Geology of the WL 1 and FT 9, 10 claims (geology from Frith, 1981; modified mainly from DIAND assessment report 081811).

BATHURST INLET, SOUTHEAST (WESTERN RIVER-GORDON BAY) AREA

The Bathurst Inlet southeast area is predominantly underlain by Yellowknife Supergroup metasediments and their migmatitic derivatives, intruded by leucogranite and granodiorite plutons (Figs. 8-17, 8-18).

A belt containing zones of amphibolitic metamorphosed iron formation has been extensively staked for its gold potential.

PROSPECTING PERMITS 1066-1069

Echo Bay Mines Ltd.	Gold
3300 Manulife Place	76 J/1,2
10180-101 St.	66°00'-66°15'N
Edmonton, Alta., T5J 3S4	106°15'-107°00'W

REFERENCES

Thompson and others (1985).
DIAND assessment report: 081910.

PROPERTY

Prospecting Permits: 1066, 1067, 1068, 1069.

LOCATION

The permits are about 520 km northeasterly from Yellowknife and 100 km southeasterly from Bathurst Inlet Lodge.

Prospecting Permits 1066, 1067, 1068 and 1069 cover NTS quadrants 76 J/1 SW, 76 J/2 NW, 76 J/2 NE, 76 J/2 SE respectively.

HISTORY

The permits were granted on February 1, 1985.

DESCRIPTION

The geology of the permit area from Thompson and others (1985) is shown in Figure 8-17.

CURRENT WORK AND RESULTS

The permits were prospected and reconnoitered using low-level helicopter and ground traverses to find auriferous amphibolitic and sulphidic iron formation.

No substantial thicknesses of iron formation were found and all assays were less than 2 g/t Au.

G & T, FOX 1, 2 CLAIMS

Silver Hart Mines Ltd.	Gold
209, 320 Sioux Road	76 J/11
Sherwood Park, Alta., T8A 3X6	66°50'N, 107°20'W

REFERENCES

Thompson and others (1985, 1986).
DIAND assessment report: 081819.

PROPERTY

G & T 1-6; FOX 1, 2.

LOCATION

The claims are 580 km northeasterly from Yellowknife and 15 km southeasterly from Tinney Cove, Bathurst Inlet.

HISTORY

G & T 1-6 are owned by Bear Creek Hills Estate Ltd. G & T 1 was recorded in October 1982; G & T 2-6 in September 1983. Drilling on G & T 2 in 1984 was done by Silver Hart Mines by agreement with Bear Creek Hills Estate. Silver Hart recorded FOX 1 and 2 and other adjoining claims in March 1984.

DESCRIPTION

The regional geology has been mapped by Thompson and others (1985, 1986). The claims are largely underlain by nodular schist and metagreywacke of the Yellowknife Supergroup (Fig. 8-18). These metasediments are on the low grade side of the sillimanite isograd, which passes through the northeastern corner of the property.

CURRENT WORK AND RESULTS

During 1984, seven holes were diamond drilled on G & T 2, and intersected quartz-muscovite-biotite schists with cordierite and, locally staurolite, porphyroblasts, and amphibolite or amphibole schist.

The target, amphibole schist, is locally garnetiferous and with disseminations, layers and stringers of magnetite, pyrrhotite and pyrite. The sulphidic-amphibole schist is locally auriferous, the highest assay being 10 g/t Au across 0.37 m.

During 1984-85, Silver Hart Mines, Echo Bay Mines Ltd. and others staked a considerable amount of ground in two belts (Fig. 8-18).

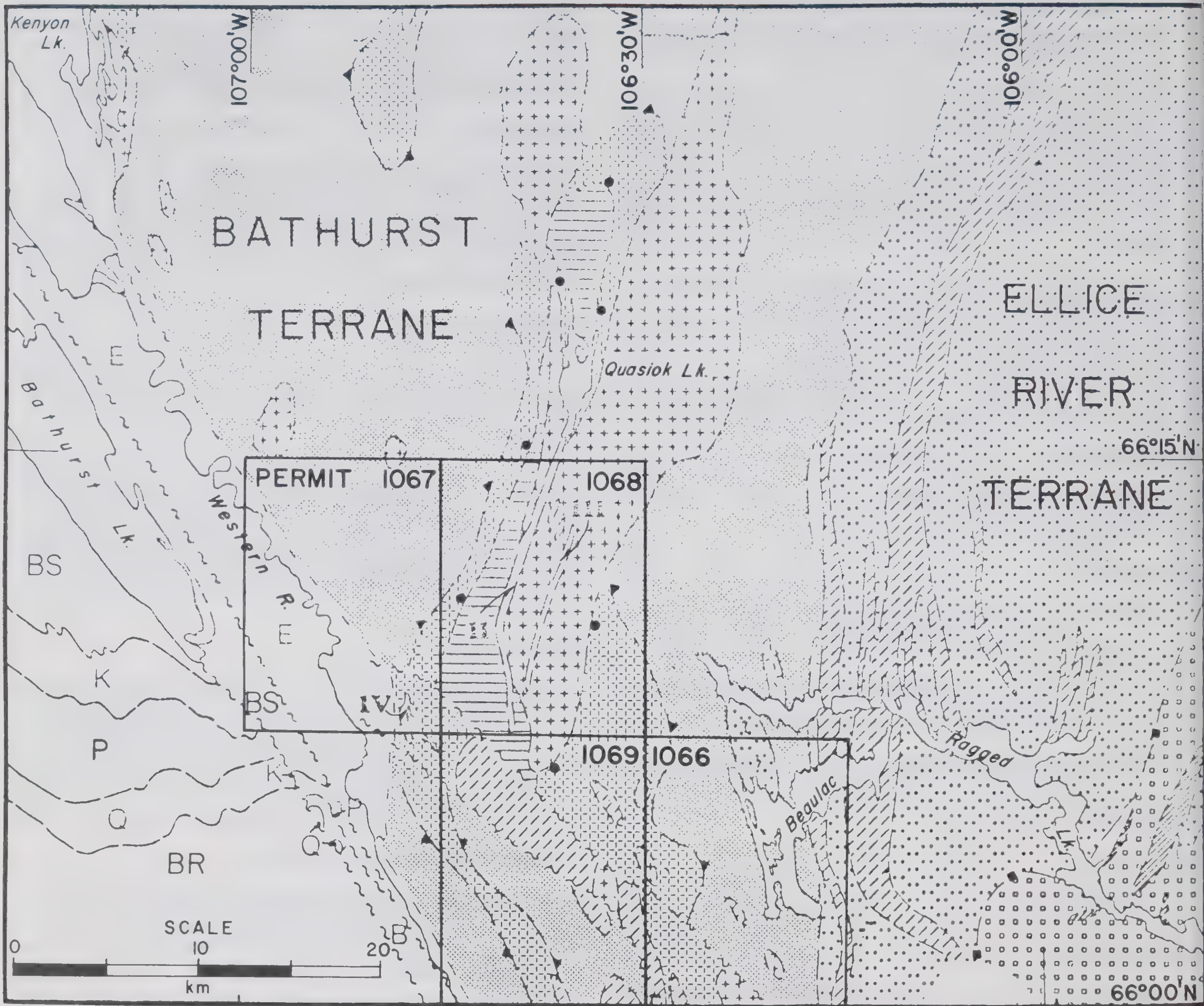


FIGURE 8-17: Geology of the Prospecting Permits 1066-1069 (geology from Thompson and others, 1985).

THE WILBERFORCE BASIN

The "Wilberforce Basin" is an irregularly shaped area of metasediments extending from the James River in the north across the Hood River, to the Booth River in the south. Wilberforce Falls lies just east of, and outside, the area underlain by the metasediments of the basin.

PISTOL (FARN-KNUT) PROJECT

Silver Hart Mines Ltd.	Gold
209, 320 Sioux Road	76 K/15, 76 N/2
Sherwood Park, Alta.,	66°59'-67°05'N,
T8A 3X6	108°43'-108°55'W

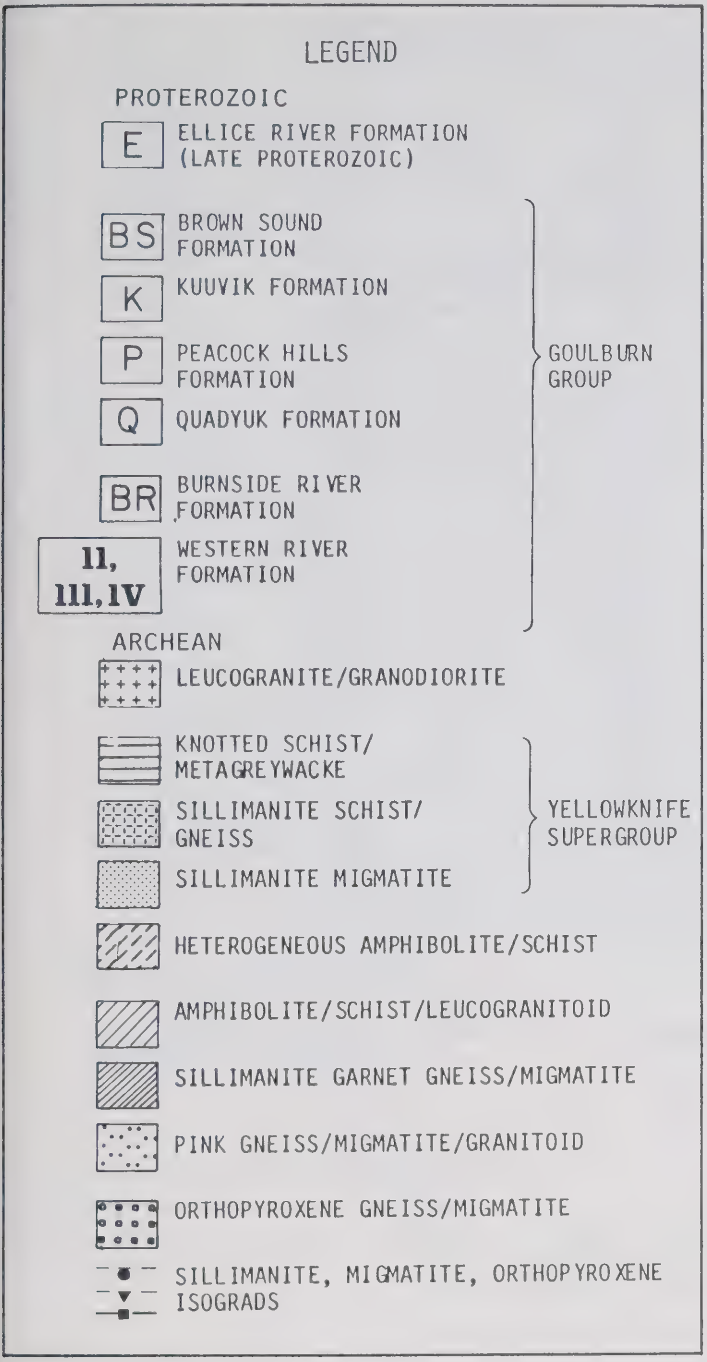
REFERENCES

Fraser (1964); Schiller (1965); Thorpe (1966, 1972); and Seaton (1984).

DIAND assessment reports: 017144, 017151, 017163, 017166 and 081345.

PROPERTY

FARN; KNUT; PISTOL 1-3; WOLF 2-4, 5-9.



LOCATION

The property is 575 km northeasterly from Yellowknife and less than 1 km west of the Hood River. Wilberforce Falls is 2.5 km north of the property. Access is by float plane to "Pistol Lake" in the western part of the property; an esker 3 km from the property has been used by Twin Otter aircraft on wheels.

HISTORY

Noel Avadluk discovered gold in the area in 1964 and staked 36 NOEL claims to cover the showings. That year the claims were optioned by Roberts Mining Company Ltd. Subsequent exploration history is summarized by Schiller (1965), Thorpe (1966, 1972) and Seaton (1984). The showings were restaked as the FARN and KNUT claims by Goldfields Exploration Canada Ltd. in October 1979.

In 1984, FARN and KNUT were optioned by Silver Hart Mines Ltd. from Goldfields Exploration Canada Ltd.

DESCRIPTION

The property is largely underlain by Yellowknife Supergroup metasediments, which are intruded by large diabase sills or dykes and granitoid rock. Auriferous, sulphidic, silicate- and oxide-facies iron formation units within the metasediments are the exploration target.

CURRENT WORK AND RESULTS

Mapping and diamond drilling programs commenced in 1984. A total of 346 m in eight holes was drilled on FARN, and a total of 692 m in six holes on KNUT.

In 1985, 5550 m of drilling in 35 holes was completed on FARN and KNUT. Much of this drilling was on the F-Zone south of "Knutsen Lake" on KNUT and on the G-Zone east of Knutsen Lake.

Geological mapping revealed isoclinal folds with a steep southerly plunge and two units of iron formation. The F-Zone is in an amphibolitic iron formation unit, which is locally garnetiferous. To the southeast, the second iron formation hosts the G-Zone, which is a banded magnetite- and cummingtonite-bearing chert, locally containing pyrrhotite, arsenopyrite and pyrite, and cross-cut by quartz veins. Folding is on a roughly 300 m wavelength. Most dips are 35° to 50° to the west.

Mapping suggests that metamorphosed iron formation units have been locally refolded about northeasterly axes, contained in regional cleavage-foliation planes that are vertical or steeply southeasterly dipping.

Silver Hart Mines staked periferally to the FARN-KNUT claim block and recorded WOLF 2, in May 1984, WOLF 5, 9 in September 1984 and PISTOL 1-3 in September 1985.

HIGH LAKE AND ANIALIK RIVER SUPRACRUSTAL BELTS

The High Lake Supracrustal Belt (Easton and others, 1982) is part of a northerly trending complex of mainly volcanic rocks, intruded to the west by extensive granitic plutons and flanked to the east by volcaniclastic, carbonate and turbidite sediments.

The Anialik River Supracrustal Belt lies northwest of the High Lake Supracrustal Belt to which it is linked by an "isthmus" of volcanic rocks.

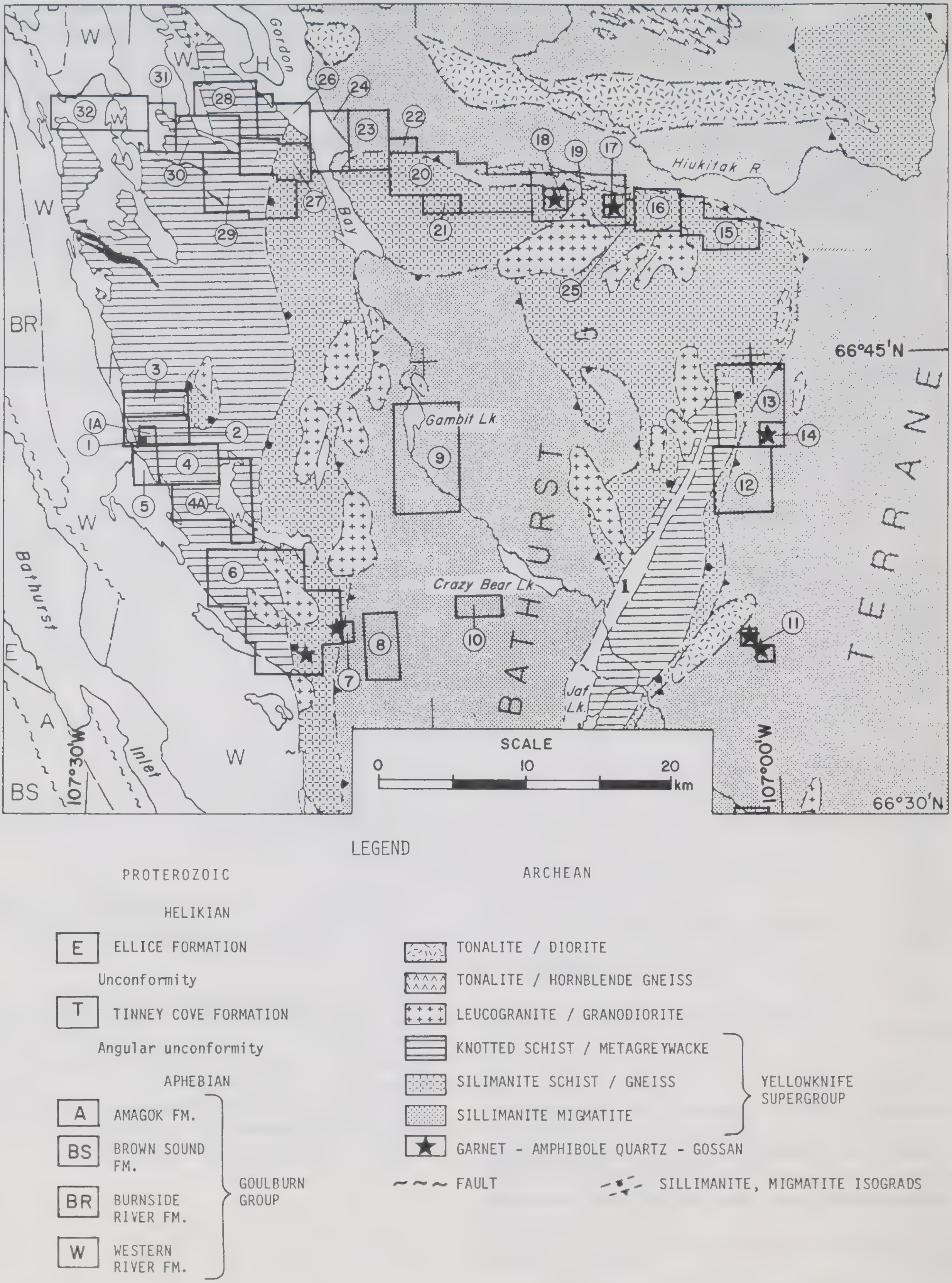


FIGURE 8-18: Geology of the G&T, FOX 1, 2 and other claims (geology from Thompson and others, 1985).

KEY TO PROPERTIES ON FIG. 8-18

No.	NTS	Registered	Claims	Owner
1	76J/11	82-10-18	G&T 2	BCHE
1A	76J/11	83-09-19	G&T 1,3,6	BCHE
2	76J/11	84-03-26	FOX 1, 2	SHML
3	76J/11	85-09-09	FOX 5, 6	SHML
4	76J/11	84-03-26	FOX 3	SHML
4A	76J/11	84-03-26	CHAR 1, 2	SHML
5	76J/11	85-09-09	FOX 4	SHML
6	76J/11	84-10-09	HEN 1-6	EBML
7	76J/11	85-03-18	BC 6	BCHE
8	76J/11	85-08-22	NEST	EBML
9	76J/10,11	85-08-12	JAN 1-3	EBML
10	76J/10	84-08-28	CLEAR	GBW
11	76J/9,10	85-03-18	BC 4,5	BCHE
12	76J/9,10	85-09-27	WING	EBML
13	76J/9,10	85-09-13	LB 1-2	LEA
14	76J/9	85-10-28	BC 3	BCHE
15	76J/15,16	85-10-17	EGG 2,3	EBML
16	76J/15	85-07-25	EGG	BCHE
17	76J/15	85-03-18	BC 2	BCHE
18	76J/15	85-03-18	BC 1	BCHE
19	76J/15	85-09-3,6	BEAR 1, 4-6	EBML
20	76J/14,15	85-08-22	BEAR 2,3	EBML
21	76J/15	85-09-06	BEAR 7	EBML
22	76J/14	85-10-17	BEAR 10	EBML
23	76J/14	85-09-27	BEAR 9	EBML
24	76J/14	85-09-27	HUNT 8	EBML
25	76J/14	85-10-17	BEAR 8	EBML
26	76J/14	85-10-17	HUNT 7,13	EBML
27	76J/14	84-10-09	HUNT 1,2	EBML
28	76J/14	85-09-27	HUNT 9,10	EBML
29	76J/14	85-08-22	HUNT 4,5	EBML
30	76J/14	85-07-29	HUNT 3	EBML
31	76J/14	85-10-17	HUNT 6	EBML
32	76J/13,14	85-09-17	HUNT 11,12	EBML

**Abbreviations:*
BCHE Bear Creek Hills Estate Ltd.
EBML Echo Bay Mines Ltd.
GBW GB Warner
LEA Lloyd E. Anderson
SHML Silver Hart Mines Ltd.

BLACKRIDGE 1, BR 1,2 CLAIMS

Aber Resources Ltd.	Gold
400, 805-8th Ave. SW.	76 L/15
Calgary, Alta.,	66°52′N, 110°52′W
T2P 1H7	

REFERENCES

Fraser (1964).
DIAND assessment reports: 018788, 019502, 060671, 060819, 061408 and 061873.

PROPERTY

BLACKRIDGE 1; BR 1,2.

LOCATION

The claims are 425 km north-northeasterly from Yellowknife.

HISTORY

BLACKRIDGE 1 was recorded in September 1983. Borealis Exploration Ltd. explored NTS area 76 L/15 (DIAND assessment reports 018788, 019502, 060671, 060819, 061408 and 061873).

DESCRIPTION

The claim lies in the southern part of the High Lake Supracrustal Belt. Fraser (1964) mapped this area at a reconnaissance scale of 1:506,880.

CURRENT WORK AND RESULTS

In 1985, BLACKRIDGE 1 was explored with mapping, and magnetic and VLF-EM surveying. A weakly auriferous zone was explored by diamond drilling. Results were presumably sufficiently encouraging to warrant the staking of BR 1 and BR 2 to the north and east of BLACKRIDGE 1. BR 1 and 2 were recorded in October 1985.

GRUMPY CLAIM

Echo Bay Mines Ltd.	Gold
3300 Manulife Place	76 M/10
10180-101 St.	67°36′45″N,
Edmonton, Alta., T5J 3S4	110°40′30″W

REFERENCES

Easton and others (1982).
DIAND assessment report: 081982.

PROPERTY

GRUMPY.

LOCATION

The property, 580 km north-northeasterly from Yellowknife, is at the south end of "Grumpy Lake", a small lake which drains into the Kennarctic River.

HISTORY

GRUMPY was recorded in August 1984.

DESCRIPTION

The claim is underlain mainly by granitoid rock (mainly monzogranite and minor diorite), felsic volcanics and metasediments (greywacke turbidites). The regional geology has been mapped at 1:31,680 by Easton and others (1982).

CURRENT WORK AND RESULTS

The discovery of auriferous quartz veins at the south end of "Grumpy Lake" in June 1984 was followed by more detailed sampling, staking and grid construction (Fig. 8-19). The grid covers part of a body of diorite to quartz-diorite. The quartz-diorite hosts several shallow-dipping auriferous quartz veins. Arsenopyrite, pyrite, chalcopyrite, pyrrhotite, chlorite and tourmaline are reported to be associated with the vein quartz and, together, they locally account for as much as 10%

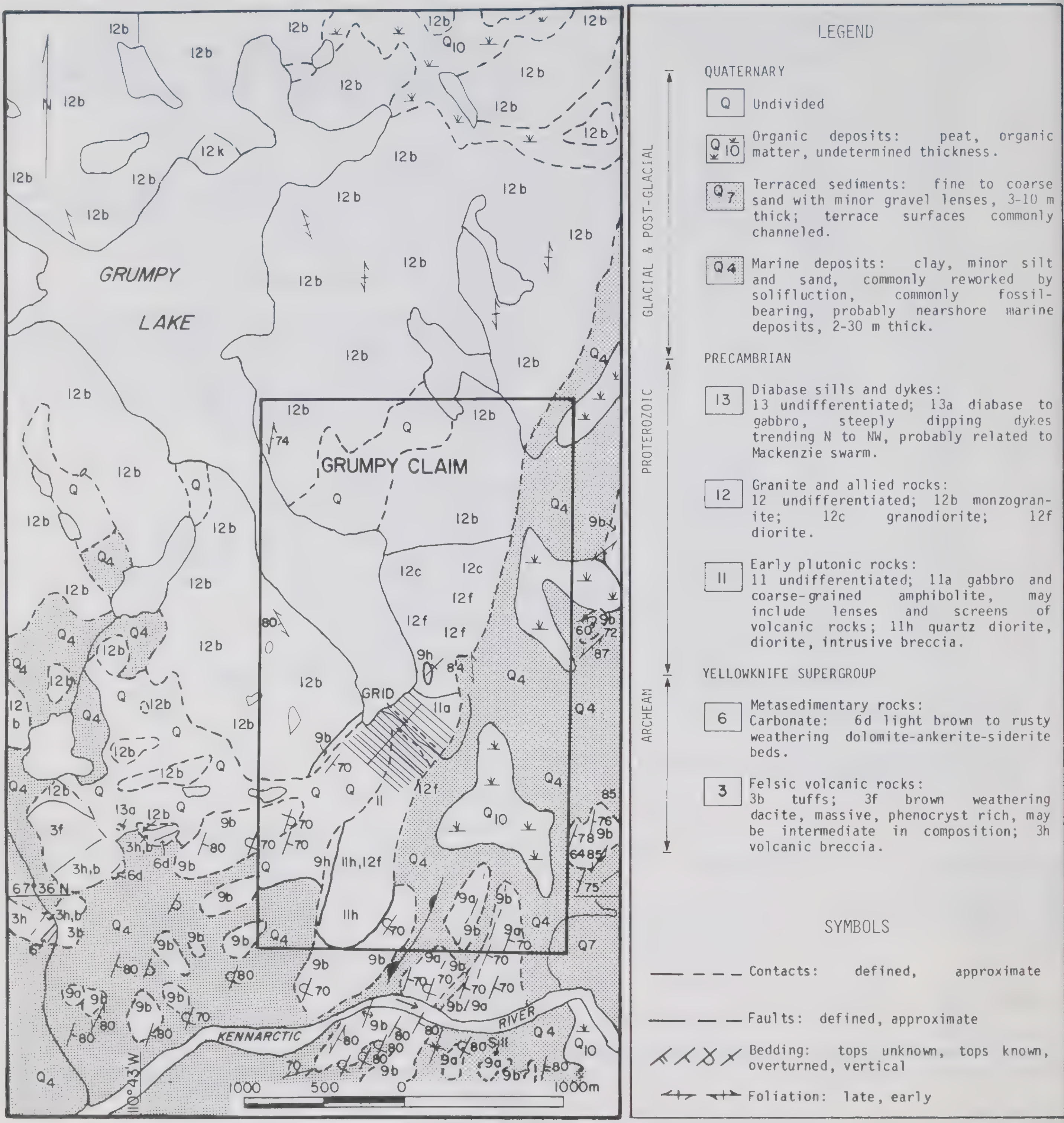


FIGURE 8-19: Geology of the GRUMPY claim (geology from Easton and others, 1982).

of the vein rock. The wall rock is commonly silicified and chloritized.

The outcrop of the MOV vein and 7 trenches on the MOV vein were chip sampled, as were several other quartz veins on the grid. Quartz boulders from various parts of the grid were also sampled. Gold assays were encouraging but silver assays were low.

A levelling survey was performed and the grid was contoured at 3 m intervals.

Soil samples from the grid were assayed for gold, arsenic and copper. Gold and arsenic anomalies were frequently coincident, including one over the MOV vein.

VLF-EM, total field magnetic and magnetic gradient surveys were used to explore the grid. The total field magnetic

survey outlined iron-rich phases of the diorite. The VLF-EM and magnetic gradient surveys gave little useful information.

ARCADIA PROPERTY

Echo Bay Mines Ltd.	Gold
10180-101 Street	76 M/11
Edmonton, Alta.,	67°40'00''-67°44'15''N
T5T 3S4	111°18'45''-111°27'00''W

REFERENCES

Fraser (1964); Gibbins and others (1977); Jackson and others (1985); Padgham and others (1976); Schiller (1965); Seaton (1978, 1984); Seaton and Crux (1985); Seaton and Hurdle (1978); Tirrul and Bell (1980) and Yeo and others (1983).

PROPERTY

DOE 1; 50 H; 1 MC; 18 N; 42 P; 20 Q; 5 R; 2 SEADOG and 7 X claims.

LOCATION

The property (Fig. 8-20) is 600 km north-northeasterly from Yellowknife. The centre of the property is roughly 14 km southwesterly from Grays Bay, Coronation Gulf.

HISTORY

The exploration history is summarized in Gibbins and others (1977), Padgham and others (1976), Schiller (1965), Seaton (1978, 1984), Seaton and Crux (1985) and Seaton and Hurdle (1978).

DESCRIPTION

Maps by Yeo and others (1983) at 1:31,680 and Jackson and others (1985) at 1:30,000 include the "Arcadia" property area. Geology much simplified from the latter map is shown in Figure 8-20, which shows the location of the main veins relative to claim blocks, and topographic features.

Numerous assessment reports describing work in the area, mainly in the sixties, are filed. Some of these reports include geological maps.

CURRENT WORK AND RESULTS

During 1984, Echo Bay Mines Ltd. drilled 68 holes totalling about 10,600 m. From north to south across the property (Fig. 8-20), the following veins were tested: the Fred Vein (10 holes), the North Vein (45 holes), the Sidewalk Vein (10 holes) and the No. 3 or C Vein (4 holes).

Tonnage and grade estimates by Watts, Griffis and McOuat (for Canuc Resources Ltd. from which Echo Bay Mines optioned the property) and by Echo Bay Mines differ greatly. Echo Bay Mines estimated proven, probable and possible reserves at 145,850 t (160,772 tons) grading 12.0 g/t Au (0.35 oz/ton) in the North Vein Central and 34,780 t (38,338 tons) grading 15.1 g/t Au (0.44 oz/ton) in the Fred Vein. Watts, Griffis and McOuat, using different criteria, estimate proven and probable reserves to be somewhat larger - 668,595 t (737,000 tons) grading 7.2 g/t Au (0.21 oz/ton) and 91,625 t (101,000 tons) at 8.6 g/t Au (0.25 oz/ton) respectively (Northern Miner, May 23, 1985).

EOKUK INLIER

The Eokuk Inlier or Uplift (of Archean rocks) is flanked to east, west and south by Aphebian sediments and to the north by the waters of Coronation Gulf. It is essentially composed of granitoid rocks, minor mafic and ultramafic intrusives and by gneissic granitoid rocks.

NERAK CLAIMS

Echo Bay Mines Ltd.	Gold, Silver,
3300 Manulife Place	Nickel, Cobalt
10180 - 101 St.	86 P/9
Edmonton, Alta., T5J 3S5	67°40'N, 112°15'W

REFERENCES

Hoffman and others (1983); Seaton and Crux (1985).
DIAND assessment report: 081837.

PROPERTY

NERAK 1-4.

LOCATION

The claims are on and near the shore of Coronation Gulf, 590 km northerly from Yellowknife and 35 km west of the mouth of the Tree River.

HISTORY

The claims were recorded in the spring of 1983 and acquired by Westsun Petroleums and Minerals Ltd. The property was mapped and prospected and a native silver-bearing quartz-carbonate vein was sampled.

In March 1984, Echo Bay Mines Ltd. obtained an option on the NERAK 1-4 claims.

DESCRIPTION

The claims cover part of the Archean Eokuk Inlier (Fig. 8-21), which is flanked by the Tree River Fold Belt and the Asiak Fold and Thrust Belt (Hoffman and others, 1983) and, to the north, by the waters of Coronation Gulf.

The Eokuk Inlier is composed largely of granitoid rocks which are penetrated by late Proterozoic Coronation gabbro sills.

The silver-bearing Nerak Vein (on NERAK 1) is northwesterly trending, moderately to steeply dipping and hosted by a mafic-ultramafic sill.

CURRENT WORK AND RESULTS

In 1984, Echo Bay Mines prospected NERAK 1-4 and constructed a 400 by 200 m grid covering the northwesterly trending Nerak Vein and its inferred on-strike extensions. The grid, in the eastern part of NERAK 1, was explored by: geological mapping at 1:500 scale, soil sampling, with

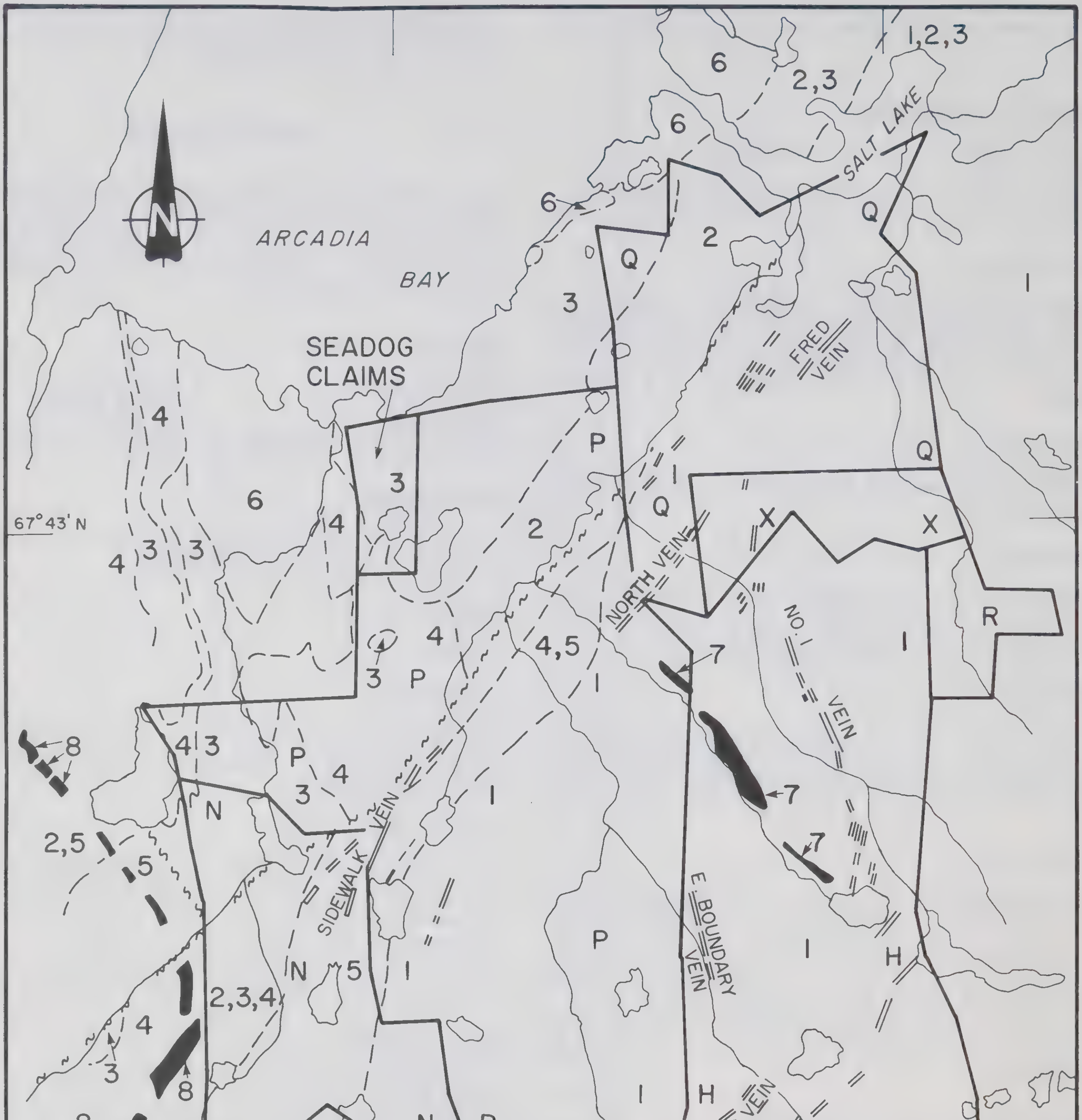


FIGURE 8-20: Geology of the "Arcadia" Property: claim groups and main auriferous veins (geology, much simplified, after Jackson and others, 1985).

LEGEND

ARCHEAN OR PROTEROZOIC

auriferous quartz veins; age unknown

PROTEROZOIC

8 Gently dipping gabbro and diabase dykes and sills of the Hadrynian Franklin Swarm

7 North-northwest trending dykes, possibly of the Helikian Mackenzie Swarm

ARCHEAN

6 Granite-granodiorite: biotite-hornblende granite -granodiorite intruded by pink quartz+/-feldspar porphyry and green to black diabase and gabbro dykes; chlorite-biotite granite (quartz-rich) intrusive into units 1 and 4

5 Mixed plutonic and volcanic rocks: mixed meta-gabbro/diorite and fine grained amphibolite or chlorite schists and/or fine grained pink felsic rocks (volcanic rocks or pink leucocratic felsic dykes, varying from fine grained quartz-feldspar phyric to aplitic and to fine-grained granitic); alternating fine grained granite or pink-weathering quartz +/- feldspar porphyry and metagabbro/diorite

4 Early plutonic rocks: metagabbro/diorite and coarse-grained amphibolite; metadiorite to quartz diorite

3 Felsic volcanic rocks: mainly pink-weathering quartz +/- feldspar porphyry, often containing blue-grey oval to round quartz eyes, and pink leucocratic felsic dykes varying from fine grained and quartz/feldspar phyric to aplitic to fine grained granitic

2 Intermediate volcanic rocks: mainly mixed intermediate to mafic rocks (chlorite schists and amphibolites); lesser amounts of: massive to bedded, plagioclase-phyric flows (?) often brown weathering; fragmental (intermediate fragments in a matrix of variable composition); thin banded unit consisting of intermediate to mafic layers with lesser felsic volcanic layers

1 Anialik River Granite Gneiss Complex (in part possibly older than supracrustal rocks)

Legend modified and abbreviated from Jackson and others (1985).

Letters N, P, Q, etc. denote claim groups (eg. N claims). Most of property has been converted to mining leases.

analyses for silver, nickel and cobalt; and VLF-EM and scintillometer surveys. The Nerak Vein was tested by 20 diamond drill holes; a nearby sulphide-bearing zone by one hole. A total of 827 m was drilled.

Geological mapping showed the Nerak Vein to be hosted by a crudely layered, mafic-ultramafic sill of unknown age, that dips moderately to the west. The sill comprises diorite, gabbro, pyroxenite, peridotite, hornblendite and sulphide cumulate rock. Peridotite was not logged in drill core, though heavily serpentinized pyroxenite was reported. The southern part of the grid was mapped as undifferentiated gneiss, granite gneiss and migmatite. Numerous quartz-carbonate veins and granophyre, granite, aplite and pegmatite dykes cross the grid. The veins trend northwesterly and the dykes range from west-northwesterly to north-northwesterly in trend. Five main sulphide cumulate zones were outlined in the western half of the grid; all are cut by the Nerak Vein.

Twenty holes, along a strike length of 180 m, were drilled, with drill sites at 20 m intervals. Drill core samples were analyzed for gold, silver, nickel, cobalt and, in a few cases, platinum. Except for two holes, where concentrations of 'high-grade' native silver across 0.3 cm were intersected, assays were uniformly low (mostly less than 1.0 g/t Ag across narrow vein intercepts). Nickel and cobalt have been reported accompanying silver in the Nerak Vein.

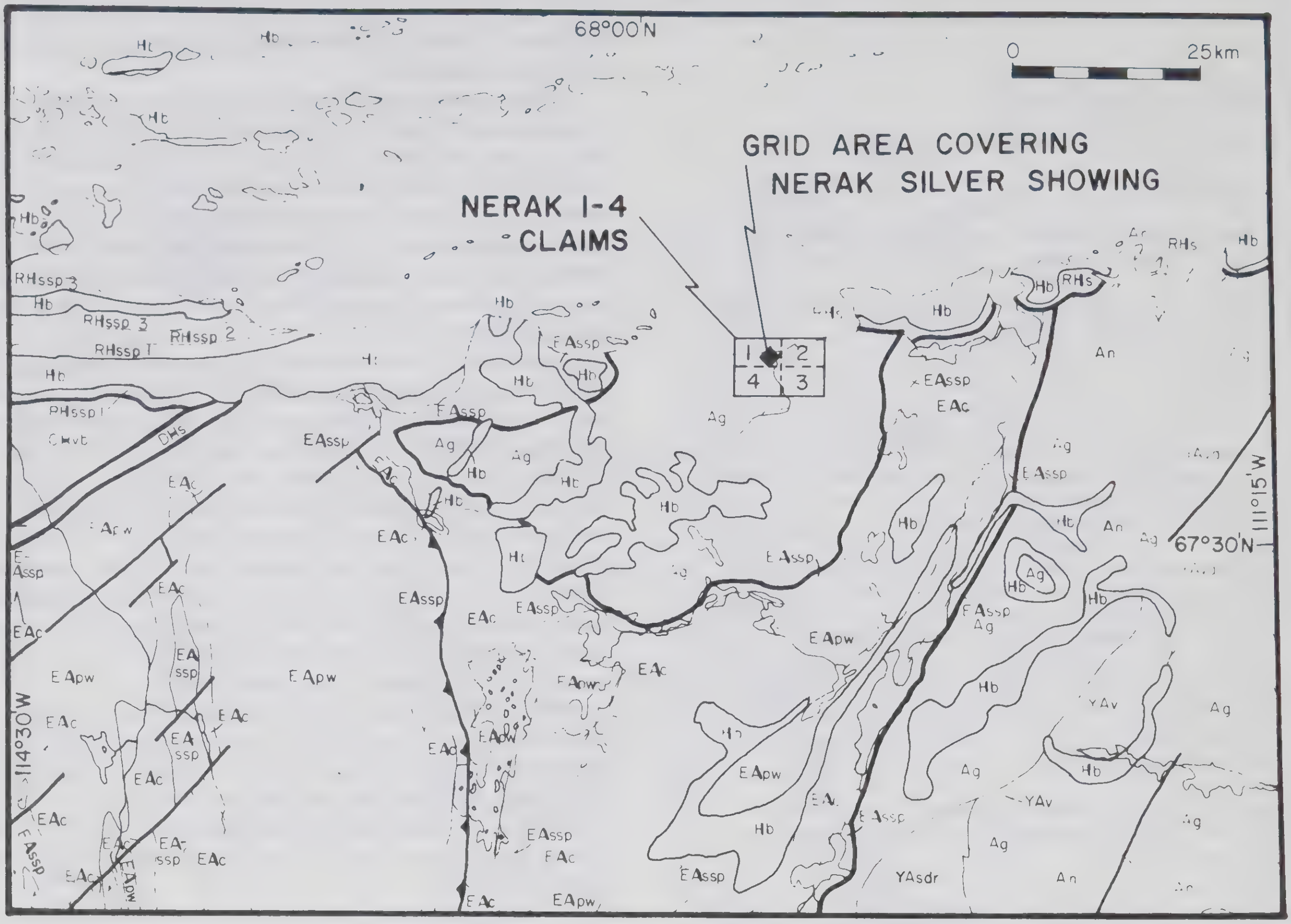
Drilling showed that the Nerak Vein dips 40º to 60º to the northwest. The apparent dip of the mafic-ultramafic sill is relatively shallow compared to the dip of the Nerak Vein.

Soil sampling outlined several coincident anomalous concentrations of silver, nickel and cobalt that are, in part, related to the Nerak Vein, and in part, correlative with sulphide cumulate zones.

VLF-EM conductors were in many cases explained by conductive overburden or topographic features, but along 20 m of its length, the Nerak Vein appears to be conductive. In the eastern corner of the grid a 30 m long conductor, a silver anomaly in soils and quartz carbonate veins may be mutually related. Sulphide cumulate zones surprisingly are not conductive in the area surveyed.

No additional silver showings nor areas underlain by mafic-ultramafic complexes were found through prospecting.

The Nerak Vein shows that precious metal deposits, in the northern Slave Province, may be hosted by a variety of rocks and are commonly found in areas where the late Proterozoic Coronation gabbro sills cut Archean and younger rocks. Such deposits are exemplified by the "Arcadia" property auriferous quartz veins, near Grays Bay (76 M/11), the Grumpy Lake gold-bearing quartz veins (76 M/10) and the Roberts Lake silver deposits (77 A/3). If these late, essentially undeformed, precious metal-bearing veins are found in both the plutonic and supracrustal rocks of the northern Slave Province and if there is a Cobalt, Ontario-style spacial association of the veins with mafic sills and with sulphidic zones in the wall rocks, then a wide area of Archean and other pre-Coronation-sills rocks may be considered as potentially fruitful prospecting ground. In much of the northern Slave Province outcrop is abundant and the ground is well suited to traditional prospecting, as are vein-type precious metal deposits. Hitherto, exploration has been concentrated in supracrustal belts of the Slave Province, but the Nerak, Arcadia and Grumpy Lake showings suggest that areas underlain by plutonic rocks should not be ignored.



LEGEND

PROTEROZOIC

Hb — Gabbro sills and sheets. Includes Coronation and Franklin intrusions

RAE GROUP

RHssp3 — Shaly sandstone, siltstone, shale

RHssp2 — Red and green sandstone, mudstone

RHssp1 — Sandstone, siltstone, shale

RHs — Rae Group undivided

EPWORTH GROUP

EApw — Rocknest Fm: dolomite

EAc — Odjick Fm: sandstone, shale, mudstone

EAssp — Recluse Fm: argillite, shale, greywacke turbidites

COPPERMINE RIVER GROUP

CHvb — Copper Creek Fm: basaltic flows, minor sandstone

DISMAL LAKE GROUP

DHs — Dismal Lake Group undivided

ARCHEAN

Ag — Quartz diorite, granodiorite, quartz monzonite and granite. In part porphyritic. Granitic rocks undivided.

An — Granitic gneiss and migmatite and mixed gneisses involving Yellowknife Supergroup rocks.

YELLOWKNIFE SUPERGROUP

YAsdr — Cordierite-andalusite-bearing knotted schists and other metamorphic equivalents of Yellowknife Supergroup sedimentary rocks

YAva — Felsic lava, tuff, agglomerate and ash flow tuff with minor undifferentiated mafic volcanic rocks

YAv — Volcanic rocks undivided

FIGURE 8-21: Regional geology and properties of the Eokuk Inlier: NERAK 1-4 claims and grid area (geology from McGlynn, 1977).

POINT LAKE — ITCHEN LAKE CONTWOYTO LAKE METASEDIMENTARY BELT AND LUPIN MINE AREA

This belt of metasediments of the Contwoyto and the Itchen Formations (Bostock, 1980), describes a northward convex arc on the northern side of the Central Volcanic Belt (also known unofficially as the Olga Lake Volcanic Belt) (Figs. 8-22 and 8-28).

The Contwoyto Formation, which contains amphibolite (metamorphosed iron formation) zones and lenses, lies to the north, east and west of the Itchen Formation which generally contains no such amphibolite bodies. The areas underlain by Contwoyto Formation metasediments have been extensively staked for the gold potential of the amphibolite zones.

VIN CLAIM

Terra Mines Ltd.	Lead, Zinc, Copper
Suite 202,	Silver, Gold
7608-103rd St.	86 H/6
Edmonton, Alta., T6E 4Z8	65º21′N, 113º07′W

REFERENCES

Bostock (1980); Jackson (1982, 1984, 1985); Schiller (1965); Seaton and Hurdle (1978).

DIAND assessment reports: 017344, 080563, 080564, 081861.

PROPERTY

VIN 1.

LOCATION

The claim is 330 km north-northeasterly from Yellowknife on the southern shore of the North Arm of Point Lake (Fig. 8-22).

HISTORY

The ground was first staked as CAM 1-10 in 1964 for Nahanni Mines Ltd. Point Prospecting Syndicate, an affiliate of Nahanni Mines, carried out prospecting and mapping at 1:6360. Three galena-pyrite showings were discovered in quartz veins along shear zones (Schiller, 1965; DIAND assessment report 017344).

In 1975, Texasgulf Inc. staked the area as the ROB and ROR claims. Two grids were set up over part of the claims; soil samples were analyzed for lead, zinc, copper and silver. Several copper-zinc anomalies and one copper anomaly were discovered (DIAND assessment reports 080563, 080564; Seaton and Hurdle, 1978).

DESCRIPTION

Regional geology is shown in Figure 8-22. The area is underlain by Archean mafic flows and turbiditic metasediments of the Point Lake and Contwoyto Formations respectively. A granitic/granodioritic pluton lies in the central portion of the claim (Fig. 8-23).

The area has been mapped at 1:250,000 by Bostock (1980) and at 1:31,680 and 1:30,000 by Jackson (1982, 1984, 1985).

CURRENT WORK AND RESULTS

The claim was geologically mapped at a scale of 1:6000. Over 140 rock samples were analyzed for lead, zinc, cobalt, copper, silver, gold, bismuth and nickel. Several samples, mainly in quartz veins and zones within altered, silicified and sheared tonalite, contain anomalous concentrations of lead, zinc, silver and gold. Sulphide minerals include sphalerite, galena, pyrite, chalcopyrite and locally, pyrrhotite and arsenopyrite.

A grid was set up over part of the claim and detailed geological mapping at 1:1200 and soil sampling were carried out. Analyses of over 650 soil samples for silver, copper, zinc and cobalt outlined several coincident anomalies.

P CLAIMS

Echo Bay Mines Ltd.	Gold
3300 Manulife Place	86 H/6,7
10180 - 101st.St	65º25′N, 113º00′W
Edmonton, Alta., T5J 3S4	

REFERENCES

Bostock (1980); Henderson and Easton (1977a,b); Jackson (1982, 1984, 1985); Schiller (1965); Schiller and Hornbrook (1964); Seaton (1978); Seaton and Hurdle (1978).

DIAND assessment reports: 017343, 017345, 017346, 017348, 080464, 080527, 080560, 080561, 081840, 081850.

PROPERTY

P 1-20.

LOCATION

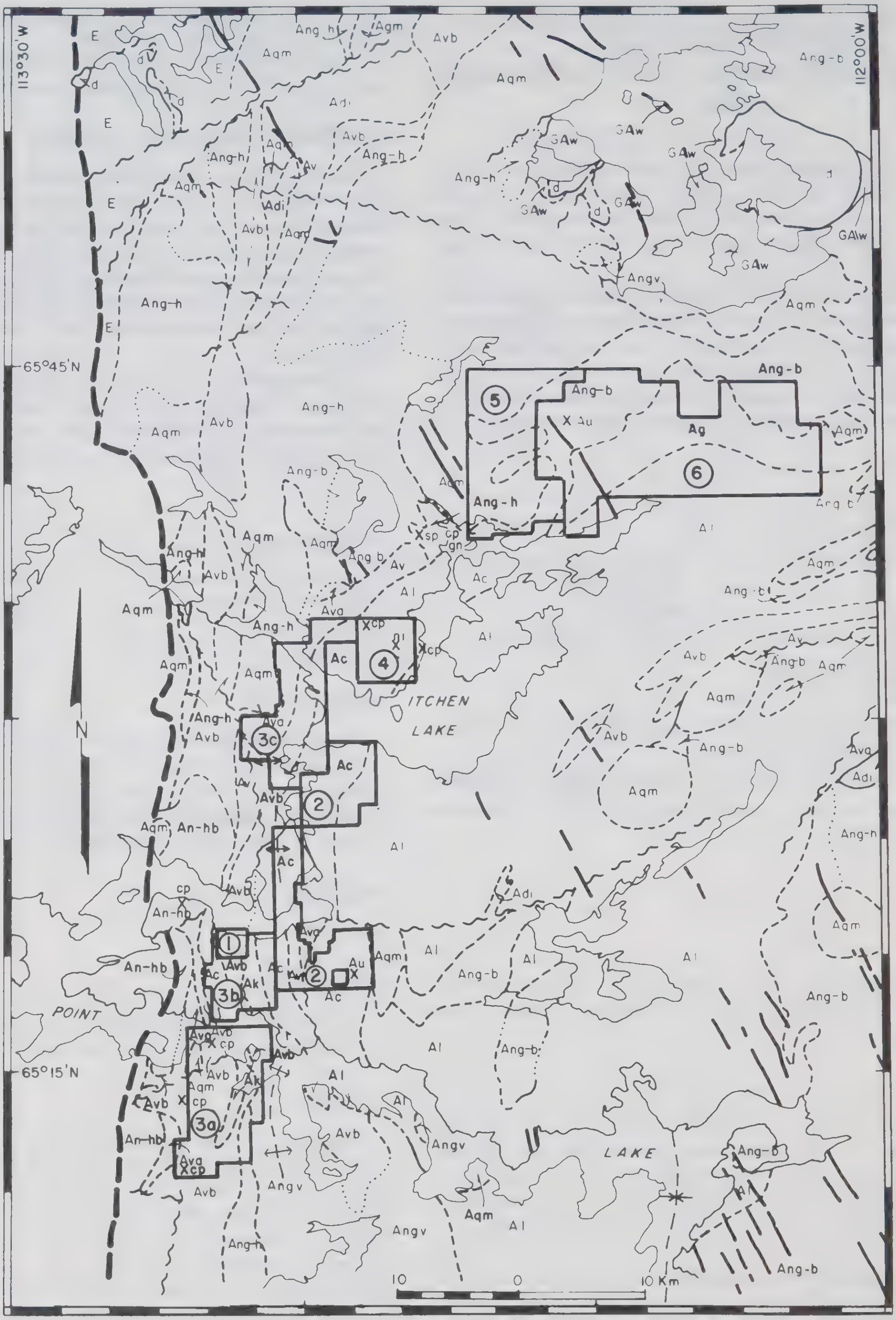
The claims are approximately 340 km north-northwesterly from Yellowknife between Itchen and Point Lakes (Fig. 8-22).

HISTORY

The area was first staked in 1963 and 1964 and formed part of the TREE, TESS, and PINE claim groups, Giant Yellowknife Mines; and the GREY and GORD groups, Point Prospecting Syndicate, an affiliate of Nahanni Mines Ltd. Work done on these claims included geological mapping, prospecting, trenching, magnetic and EM surveying and diamond drilling (DIAND assessment reports 017343, 017345, 017346, 017348; Schiller, 1965; Schiller and Hornbrook, 1964).

In 1975, the REN, RIS and FOG claims were staked for Texasgulf Inc. and covered part of the area that had been held as the GORD claims. An airborne EM survey was done in 1975. In 1975-76, soil sampling for copper, lead, zinc, silver and gold, and 838 m of diamond drilling were done (DIAND assessment reports 080464, 080527, 080560, 080561; Seaton 1978; Seaton and Hurdle, 1978).

In 1983, P 1-18 were staked by Trigg, Woollett Consulting Ltd. for Echo Bay Mines Ltd. P 19, 20 were staked in late



PROPERTIES

1	VIN 1	3c	MAX 1-8
2	P 1-20	4	CUB 1,2
3a	KES 3-9	5	PP 1074
3b	KAR 1-4	6	F 1-24, SIK 1, SKI 1

FIGURE 8-22: Regional geology and properties of the Point Lake Supracrustal Belt (geology modified from Bostock, 1980).

LEGEND

Proterozoic

- d — Diabase, gabbro: dykes and sills
- E — Epworth Group: sandstone, limestone, argillite, siltstone, quartzite, greywacke, stromatolitic dolomite
- GAw — Goulburn Group: Western River Formation argillite, greywacke, quartzite, siltstone

Archean

LAKE KENORAN PLUTONIC ROCKS

- Aqm — Quartz-monzonite, granodiorite; some granite
- Adi — Diorite, granodiorite; some amphibolite

YELLOWKNIFE SUPERGROUP

- AI — Itchen Formation: metaturbidites lacking iron formation lenses - greywacke, argillite, slate, nodular schists and gneisses
- Ak — Keskarrah Formation: metavolcanic fanglomerate-conglomerate, subgreywacke
- Ac — Contwoyto Formation: metaturbidites containing iron formation lenses - argillite, siltstone, slate, greywacke

EARLY KENORAN (?) PLUTONIC ROCKS

- Avb — Point Lake Formation: metavolcanic and related metasedimentary rocks - mafic flows, tuffs, black slate
- Av — Mixed felsic to mafic tuffs, some amphibolite, hornblende gneiss, and calc-silicate rocks
- Ava — Felsic flows and tuffs

HYBRID ROCKS

- An-hb — Banded to foliated biotite, hornblende gneisses
- Ang-b — Lit-par-lit gneiss and schist, mostly biotite-rich
- Angv — Felsic and/or mafic volcanic and hypabyssal rocks
- Ang-h — Dioritic agmatitic, mafic volcanic rocks

SYMBOLS

- geological boundary (defined, approximate, assumed)
- fault
- diabase dykes (exposed or geophysically interpreted)
- anticline
- syncline
- x Au Mineral showing
  - Au gold
  - gn galena
  - sp sphalerite
  - cp chalcopyrite
  - ni niccolite
- limit of mapping

1984. The P claims surround Kidd Creek Mines Ltd.'s FOG 82, 88-95 and REN 38-46 and Giant Yellowknife Mines Ltd.'s TREE and TESS claims. P 4, 6, 7, 15-17 lapsed in July 1986.

DESCRIPTION

The regional geology is shown in Figure 8-22; more detailed geology is shown in Figure 8-24. The area has been mapped by several geologists: Henderson and Easton (1977a,b) at 1:50,000; Bostock (1980) at 1:250,000; and Jackson (1982, 1984, 1985) at 1:31,680 and 1:30,000.

The area is predominantly underlain by metaturbidites of the Itchen and Contwoyto Formations. The Contwoyto Formation metasediments are interbedded with numerous lenses of silicate-, oxide- and carbonate-facies iron formation.

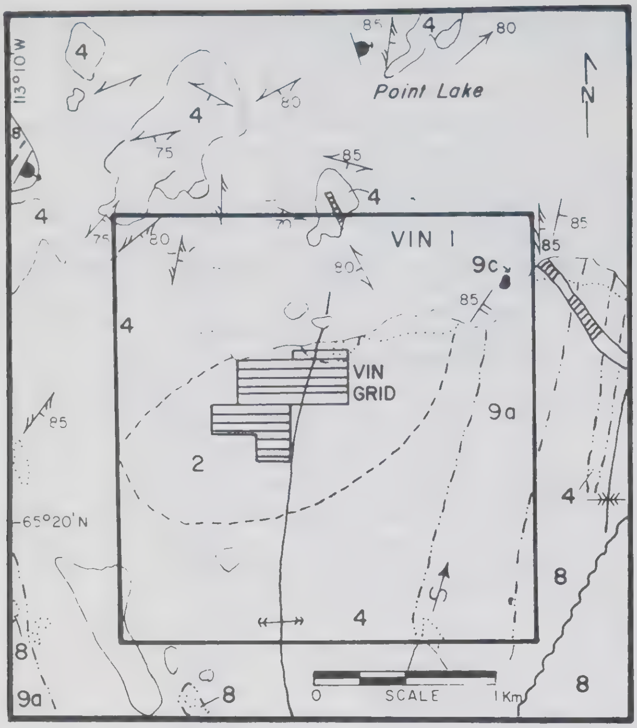
CURRENT WORK AND RESULTS

Helicopter reconnaissance prospecting and mapping were done in 1983. Three gold showings in iron formation were discovered.

In 1984, prospecting and geological mapping were undertaken at 1:20,000 scale. Over 1500 samples were assayed for gold; 41 samples assayed greater than 2.00 g/t Au.

Five grids were set up on the claims (Fig. 8-24). Mapping at 1:500, and total field and vertical gradient magnetic, IP and VLF surveying were done on each grid. Both the magnetic and VLF surveys successfully traced iron formation in areas with overburden.

Two types of gold showings were discovered: one, hosted in sulphide-rich iron formation, similar to the type at Lupin, is believed to be syngenetic in origin; the other, in faulted



LEGEND

Diabase dykes: includes Proterozoic and older dykes

Archean

9	Contwoyto Formation: turbiditic sediments 9a low-grade sediments 9c iron formation
8	Keskarrah Formation: conglomerate and sandstone
4	Point Lake Formation: mafic flows

Unconformity

2	granite-granodiorite

SYMBOLS

bedding, tops unknown: inclined

pillows: tops known

S1: inclined, dip unknown

S2: inclined

minor fold axis (may include fold shape/ sense of asymmetry)

F2 axial trace: antiform, synform

area of outcrop

geological contact: observed, readily assumed, inferred

fault

FIGURE 8-23: Geology of the VIN claim (geology from Jackson, 1982, 1985).

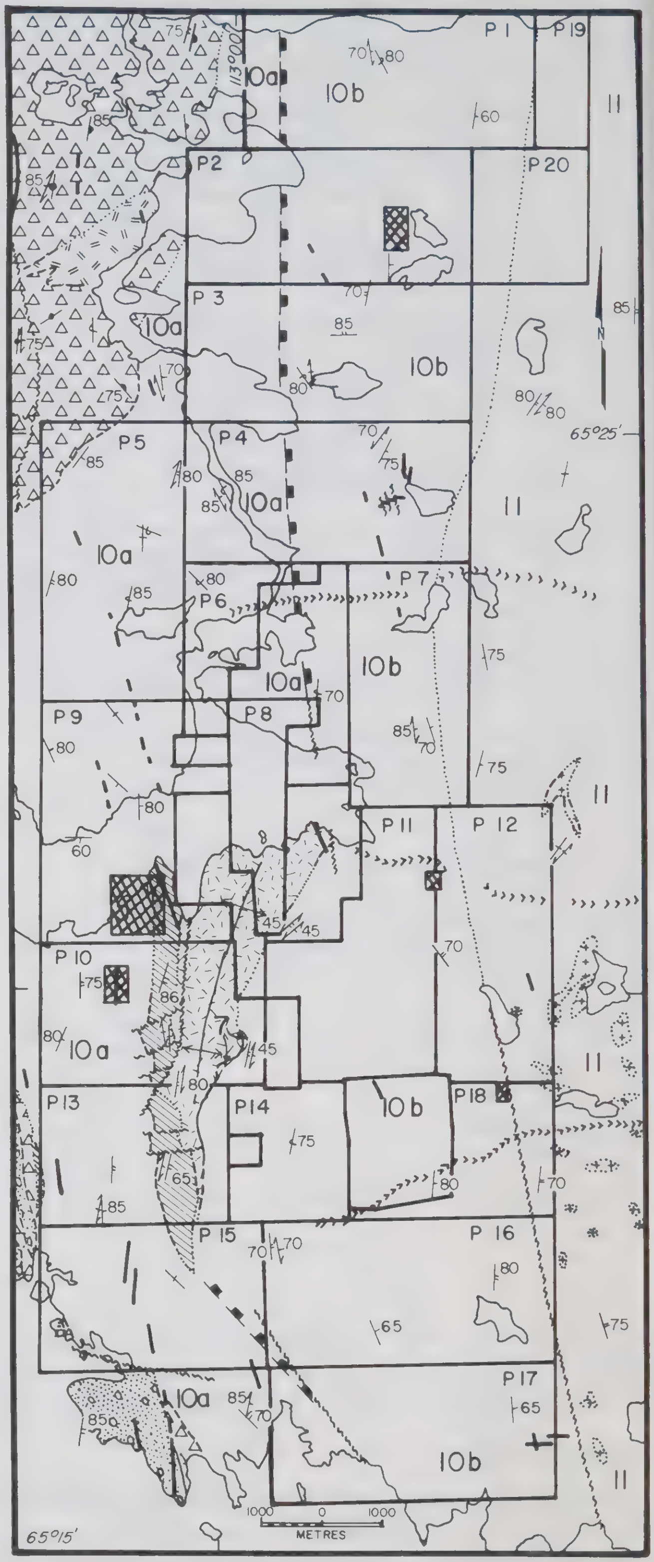


FIGURE 8-24: Geology of the P claims (geology modified from Henderson and Easton, 1977a, and Jackson, 1982, 1985).

LEGEND

Diabase

Pegmatite: biotite, muscovite and locally tourmaline bearing

Gabbro

YELLOWKNIFE SUPERGROUP

Numbered sequence of units does not imply a stratigraphic sequence.

Itchen Formation

11 Psammitic and pelitic schists with no iron formation.

Contwoyto Formation

10 Meta greywacke and mudstone with lenses of oxide, carbonate and silicate iron formation
10a meta-greywacke and mudstone (low metamorphic grade)
10b psammitic and pelitic schists (medium metamorphic grade)

Keskarrah Formation

Conglomerate with local volcanic units (4)

Point Lake Formation

7 Dolomite

Rhyolite, mainly fragmental

Dacite, mainly fragmental

Basalt, andesite; local minor dacite lenses, black shale lenses with rare quartz feldspar sandstone beds

SYMBOLS

Geological boundary: defined, approximate, assumed

Bedding: tops known, overturned, unknown

Pillowed volcanic flows: tops known, unknown

Schistosity, gneissosity, cleavage, foliation: inclined, vertical, dip unknown

Isograd (cordierite)

Generalized fold axis: anticline

Fault

Esker

Grid area

and folded lenses of oxide-carbonate facies iron formation, where gold, sulphides and arsenides have replaced part of the host rock, is epigenetic in origin.

KAR, KES, MAX CLAIMS

Noranda Exploration Company Ltd.
4-2130 Notre Dame Ave.,
Winnipeg, Man., R3H 0K1

Gold, Silver, Base Metals
86 H/3,6,7,10,11
65°10'-65°29'N,
112°51'-113°15'W

REFERENCES

Bostock (1980); Henderson (1975a); and Henderson and Easton (1977a,b).

PROPERTY

KAR 1-4; KES 3-9; MAX 1-8.

LOCATION

The claims are 305 to 340 km north-northeasterly from Yellowknife. KES 3-9 are largely south of Point Lake. KAR 1-4 are mainly between the north and south arms of Point Lake. MAX 1-8 are roughly 12 km north of the KAR claim block and lie east of Itchen Lake.(Fig. 8-22).

HISTORY

KAR 1-4, KES 3-9 and MAX 1-8 were recorded on September 18, 1985.

DESCRIPTION

KES 3-9 are mainly underlain by mafic flows and tuffs of the Point Lake Formation. The Point Lake Formation is underlain, near the eastern margin of the KES 3-9 claim block, by conglomerate and lithic sandstone of the Keskarrah Formation. The conglomerate, which lies unconformably on pre-Yellowknife Supergroup granodiorite basement, contains both clasts of locally derived Yellowknife Supergroup volcanics and clasts of basement rocks (Henderson, 1975a; Henderson and Easton, 1977a,b).

KAR 1-4 are underlain by pre-Yellowknife Supergroup basement granodiorite on the south shore of the north arm of Point Lake. The basement is exposed in the core of an anticline. Other rocks exposed on the KAR claims are mafic flows and conglomerate of the Point Lake and Keskarrah Formations, psammitic and pelitic schists with oxide-, carbonate- and silicate-facies (locally sulphidic) iron formation of the Contwoyto Formation and, along the eastern margin, mixed gneisses, granite and pegmatite; in part, possibly older than granite and pegmatite; in part, possibly older than the Yellowknife Supergroup.

MAX 1-8 are underlain by volcanics of the Point Lake Formation (Western Volcanic Belt of Bostock, 1980) and metasediments of the Contwoyto Formation which flank them to the east.

CURRENT WORK AND RESULTS

Following prospecting and reconnaissance geological mapping at 1:31,680, the KES, KAR and MAX claims were recorded.

CUB CLAIMS

Echo Bay Mines Ltd.	Gold
3300 Manulife Place	86 H/10
10180 - 101st St.	65°34'N, 112°52'W
Edmonton, Alta., T5J 3S4	

REFERENCES

Bau and others (1979); Bostock (1980); Schiller (1965); Schiller and Hornbrook (1964).
DIAND assessment reports: 017374, 017387, 081899.

PROPERTY

CUB 1,2.

LOCATION

The claims are 355 km north-northeasterly from Yellowknife on the west side of the central arm of Itchen Lake (Fig. 8-22).

HISTORY

In 1963, the area was staked as the MAR claims for Robert's Mining Co. and air photo geology at 1:62,500 was done (DIAND assessment report 017374). In 1964, three showings were mapped, magnetically surveyed, trenched and sampled. Showings 2 and 3 are on the CUB claims. CUB 1, 2 were staked by Trigg, Woollett Consulting Ltd. for Echo Bay Mines Ltd. in 1983 and 1984 respectively.

DESCRIPTION

The area was mapped by Bostock (1980) at 1:50,000 and Bau and others (1979) at 1:31,680. Regional and claim geology are shown in Figures 8-22 and 8-25.

The claims are predominantly underlain by knotted quartz-feldspar-biotite schists of the Contwoyto Formation, intercalated with lenses of iron formation. Two showings, mapped in 1964 by Robert's Mining Co., are on the CUB claims (Fig. 8-25).

Showing 2 is a mineralized, sheared, recrystallized, micaceous quartzite near the contact with a gabbro. Minerals include nickeliferous pyrrhotite, chalcopyrite, niccolite, gersdorffite, annabergite, and minor native copper, galena and pyrite. Assays ranged up to 11.66 g/t Au, 4% Cu and 7.5% Ni.

Showing 3 is a mineralized iron formation. Samples from trenches assayed up to 14.74 g/t Au (DIAND assessment report 017387; Schiller and Hornbrook, 1964; Schiller, 1965).

CURRENT WORK AND RESULTS

1983:

CUB 1 was mapped at 1:2000 and prospected. Over 200 grab samples analyzed for gold had varying results. Two gold showings in iron formation were discovered.

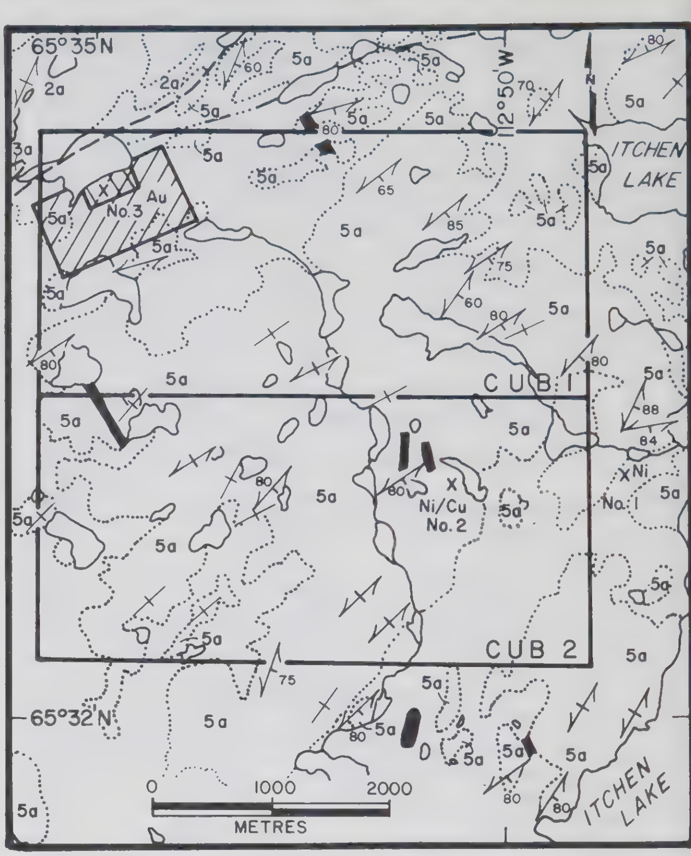


FIGURE 8-25: Geology of the CUB claims (geology modified from Bau and others, 1979; showing locations from DIAND assessment report 017387).

A magnetic survey was done over a 23 line km grid (Fig. 8-25). One northeast-trending anomaly, that coincides with a silicate facies iron formation, is possibly due to the presence of magnetite or pyrrhotite.

1984:

Prospecting and mapping continued on CUB 1 and was begun on the CUB 2 area (then unstaked). CUB 2 was staked in August 1984 to cover four gold occurrences. Detailed magnetic surveying and mapping were carried out over one gold showing on CUB 1 (Fig. 8-25). A total of 597 samples, taken from sulphide-silicate facies iron formation, were assayed for gold.

PROSPECTING PERMIT 1074

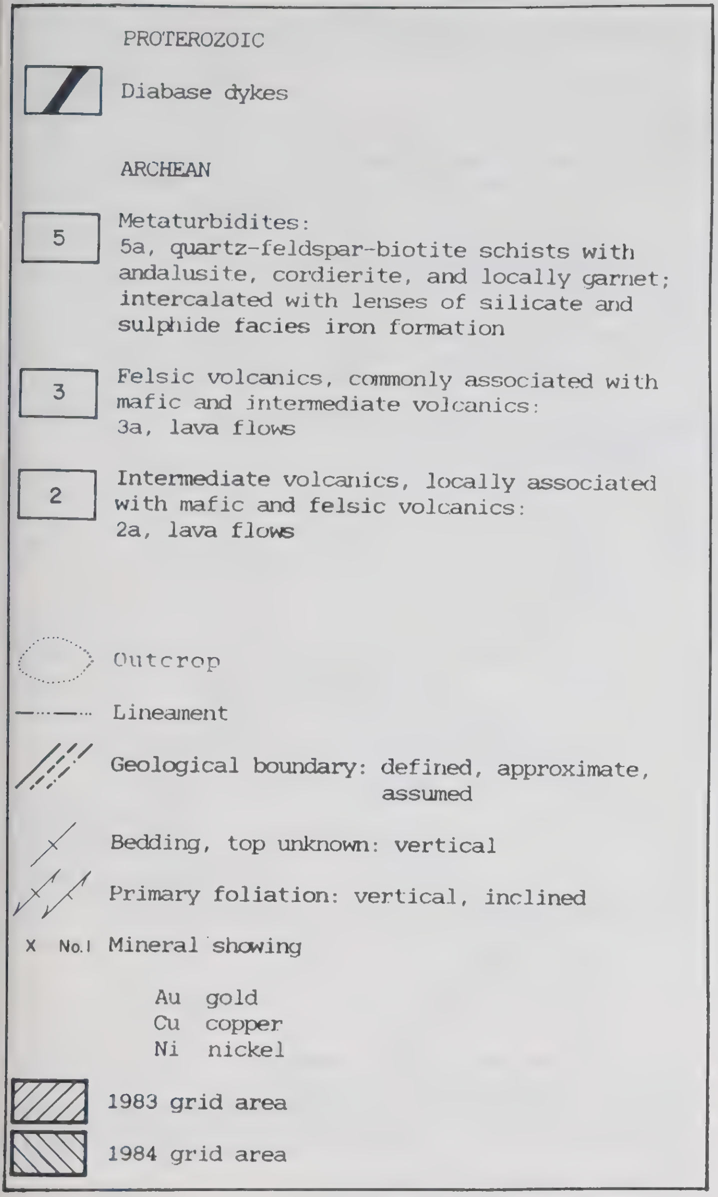
Echo Bay Mines Ltd.	Gold
3300 Manulife Place	86 H/10
10180 - 101st St.	65°37'30"N-65°45"N,
Edmonton, Alta., T5J 3S4	112°30'W-112°45'W

REFERENCES

Bau and others (1979); Bostock (1980); Seaton and Hurdle (1978).
DIAND assessment reports: 080585, 081968.

PROPERTY

Prospecting Permit 1074.



LOCATION

The permit is 370 km north-northeasterly from Yellowknife (Fig. 8-22).

HISTORY

The permit covers ground previously explored by Noranda Exploration Co. Ltd. The southwest corner of the permit was staked as the BOW claims in August 1975. In 1976, Noranda mapped and prospected the claims; airborne magnetic and Input EM surveys were also flown (Seaton and Hurdle, 1978; DIAND assessment report 080585).

The prospecting permit was granted to Echo Bay Mines Ltd. in February 1985.

DESCRIPTION

The area is underlain by Archean Contwoyto Formation metasediments, quartz monzonite and lit-par-lit gneisses (Bostock, 1980). The regional and more detailed geology of the permit area is shown in Figures 8-22 and 8-26. Bau and others (1979) and Bostock (1980) mapped the area at 1:31,680 and 1:50,000 respectively.

CURRENT WORK AND RESULTS

Helicopter-borne total field magnetic, VLF and EM surveys were flown. Two areas with coincident magnetic and VLF anomalies were outlined and are possible extensions of iron formation to the east of the permit.

F, SIK, SKI CLAIMS

Echo Bay Mines Ltd.	Gold
3300 Manulife Place	86 H/9,10,15,16
10180-101st St.	65°42′N, 112°22′W
Edmonton, Alta., T5J 3S4	

REFERENCES

Bau and others (1978, 1979); Bostock (1980); Padgham and others (1975); Schiller (1965); Schiller and Hornbrook (1964).

DIAND assessment reports: 017345, 017347, 017338, 017439, 081800, 081865, 082050.

PROPERTY

F 1-24; SIK 1; SKI 1.

LOCATION

The claims are approximately 375 km north-northeasterly from Yellowknife, to the northeast of Itchen Lake (Fig. 8-22).

HISTORY

The area was staked in 1962 and 1963, but most of the claims were dropped in 1964. Work done on these claims in 1963 is summarized in Table 8-2. In 1972, the ASP claims were staked, over the area now held as F 5, by G. Braden for Shield Resources Ltd. (historical DIAND claim maps; Padgham and others, 1975). Magnetic surveying and trenching were apparently done (DIAND assessment report 081865), but no assessment report was filed.

The SIK, SKI and F claims were staked by Trigg, Woollett Consulting Ltd. for Echo Bay Mines Ltd. in 1981 and 1983. F 16, 17 lapsed in August 1985.

DESCRIPTION

The area has been mapped by Bau and others (1978, 1979) at 1:31,680 and by Bostock (1980) at 1:250,000.

The area is underlain predominantly by Contwoyto Formation metaturbidites, with intercalated lenses of iron formation, and by Itchen Formation metaturbidites (Fig. 8-27). The contact between the Contwoyto and Itchen Formations is in the southern part of the claim group, through F 19, 23, SIK 1, F 2,5,8, and 11. The northern claims are underlain mainly by lit-par-lit gneisses and Contwoyto Formation rocks. Both the Contwoyto and Itchen Formation rocks are intruded by small bodies of granitic rocks and northwesterly trending diabase dykes.

FIGURE 8-26: Geology of Prospecting Permit 1074 (geology modified from Bau and others, 1979).

LEGEND

Diabase dykes

7 Felsic plutonic rocks:
7ap, porphyritic granite, locally with inclusions of metavolcanics, metasediments and diorite; 7b, granodiorite, locally pegmatitic and with inclusions of quartz-feldspar-biotite schists

5 Metaturbidites:
5a, quartz-feldspar-biotite schists with andalusite, cordierite, and locally garnet.

1 Mafic volcanics, locally associated with intermediate and felsic volcanics:
1c, amphibolites

Symbols

Lineament

Geological boundary: defined, approximate, assumed

Bedding, top unknown: vertical, inclined 80

Bedding, top known (arrow): inclined 80

Primary foliation: vertical, inclined, dip unknown 80

Mineral lineation with plunge 80

G Gossan

Gold is in silicate-sulphide facies iron formation lenses and is associated with arsenopyrite, pyrrhotite and loellingite (Bostock, 1980). It is usually concentrated at the nose or along the limbs of folds.

CURRENT WORK AND RESULTS

1983:

Detailed mapping at 1:2000 scale, prospecting and trenching were done over SIK 1 and SKI 1. Magnetic surveys were done on the SKI 1 and SIK 1 grids (Fig. 8-27). Five trenches on each claim were blasted in iron formation and samples assayed for gold.

Reconnaissance geological mapping and prospecting were done on the F claims. Numerous gold showings were discovered, warranting further detailed work.

1984:

Gold showings discovered in 1983 were mapped in detail. Over 3000 grab samples of iron formation were assayed for gold. Anomalous gold values averaged between 2.0 and 5.0 g/t Au; several samples had assays of greater than 10.0 g/t Au. Mapping and prospecting at 1:50,000 continued. One trench was blasted on F5.

1985:

Various parts of the claims were mapped at 1:5000, 1:1000 and 1:500. Fourteen trenches were blasted. Chip samples assayed for gold gave varying results.

Four diamond drill holes totalling 293 m were drilled through iron formation on F 5. Samples gave low gold assays over less than mineable widths.

VLF and magnetic surveying were done on the F 5, R 66, R 72 and Iyama Lake grids (Fig. 8-27). Most magnetic anomalies are due to magnetic iron formation or diabase dykes.

Airborne EM, magnetic and VLF surveys were conducted over some of the F claims (Fig. 8-27). An EM survey outlined numerous bedrock conductors, possibly indicative of sulphide-enriched zones in iron formation. Possible extensions of known iron formation were indicated by magnetic anomalies. Numerous VLF conductors were outlined and are believed to indicate zones of sulphide-bearing iron formation.

TABLE 8-2: WORK ON GROUND NOW HELD AS THE F, SIK AND SKI CLAIMS

Previous Claim Group	Owner	Work Done	References	Present Claim
AA	July 1963: staked by G. Turner & N. Avadluk; optioned to Roberts Mining Co.; dropped Aug. 1963 Sept. 1963 restaked & optioned to Giant Yellowknife Mines Ltd.	6 holes (417 m); trace to minor gold; best grab sample: 0.93 oz/T Au	017439; Schiller and Hornbrook, 1964; Schiller, 1965	F 12, 16
BAT	1963: staked by R. Beck; optioned to Giant Yellowknife Mines Ltd.; dropped 1963	mapping, sampling, gold panning EM & magnetic surveys; grab sample: 0.06 oz/T Au	017345; Schiller and Hornbrook, 1964	F 7, 9, 10, 13, 14
CAT	1963: staked by G. Turner	none	Schiller and Hornbrook, 1964;	F 3, 6, 9
FUZ	1962: staked by Canadian nickel Co. Ltd.	prospecting, mapping, magnetic survey and trenching; 6 holes (456 m); 0.36 oz/T Au	Schiller and Hornbrook, 1964; 017347	F 7, 8, 10, 11, 14, 15, 18-24 SIK 1, SKI 1
GET	1963: staked by N. Advadluk	none	Schiller and Hornbrook, 1964	F 13, 14, 18
PIT	1963: staked by Roberts Mining Co.	mapping, detailed examination of iron formations	Schiller and Hornbrook, 1964; 017388	F 4, 5, 7, 8
TEG	staked in 1963	none	Schiller and Hornbrook, 1964	F 9, 13, 17
WO	1963: staked; optioned to Giant Yellowknife Mines Ltd.; dropped Sept. 1963	sampling, mapping	017345; Schiller and Hornbrook, 1964	F 3, 14

C CLAIMS

Echo Bay Mines Ltd.
3300 Manulife Place
10180 - 101st St.
Edmonton, Alta., T5J 3S4

Gold
76 E/9,10,15
C1: 65°53′N, 110°40′W
C2-4: 65°46′N, 110°34′W

REFERENCES

Fraser (1964).

DIAND assessment reports: 017119, 017120, 017154, 017156, 017162, 017167, 081864.

PROPERTY

C 1-4.

LOCATION

C 1 and C 2-4 are 425 km and 415 km northeasterly from Yellowknife respectively, to the north of Contwoyto Lake.

HISTORY

In 1962, Prospecting Permits 33 and 35 (PP 76-E-10, PP 76-E-15) covered ground now staked as the C claims. The permits were granted to Canadian Nickel Company Ltd. who conducted airborne and ground magnetic surveys, mapping at 1:31,680 scale, detailed and reconnaissance prospecting and diamond drilling from 1962 to 1964. Several gold showings containing up to 5.83 g/t Au were discovered. The permits lapsed in 1964 (DIAND assessment reports 017119, 017120, 017154, 017156, 017162, 017167). No work was recorded for this area between 1964 and 1983, when C 1-4 were staked for Echo Bay Mines Ltd.

DESCRIPTION

Regional and claim geology are shown in Figures 8-28 and 8-29. The area was mapped by Fraser (1964) at 1:506,880.

C 1 is underlain by Archean metaturbidites of the Contwoyto Formation and intruded by Late Kenoran quartz monzonite and granodiorite. C 2-4 areas are underlain by undivided metaturbidites of the Contwoyto and Itchen Formations, mainly knotted biotite schists. Silicate-facies iron formation lenses are interbedded with the Contwoyto Formation metasediments.

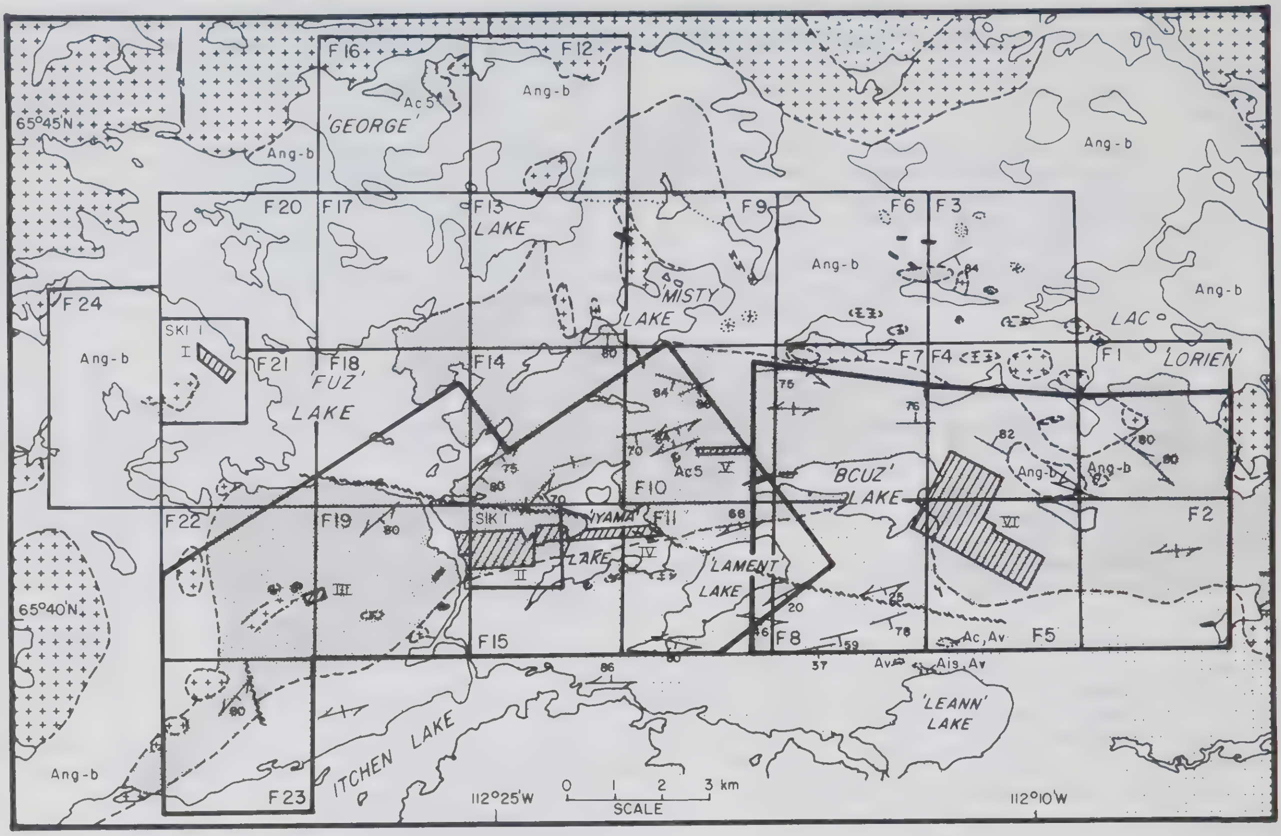
CURRENT WORK AND RESULTS

1983:

The claims were prospected and mapped on reconnaissance scale. Over 475 samples were assayed for gold. Eight gold showings (assays greater than 2.9 g/t Au) were discovered, all in silicate-facies iron formation, with or without sulphides.

1984:

Gold showings on C 2 were evaluated and further mapped and prospected. All samples assayed less than 2.00 g/t Au.



LEGEND

PROTEROZOIC

HELIKIAN

Diabase

ARCHEAN

LATE KENORAN PLUTONIC ROCKS

Quartz monzonite, granodiorite; some granite

HYBRID ROCKS
(Yellowknife Supergroup and late Kenoran diorite, granodiorite intruded by granitic rocks)

Ang-b — Lit-par-lit gneisses; biotite schists with iron formation lenses; granitic rocks containing "rafts" of metasedimentary rocks including iron formation

Felsic and/or mafic volcanic and hypabyssal rocks, some granitic gneisses intruded by Aqm

YELLOWKNIFE SUPERGROUP

ITCHEN FORMATION (metaturbidites lacking iron formation lenses): nodular quartz-plagioclase-biotite schist and gneiss, greywacke

CONTWOYTO FORMATION (metasedimentary rocks containing iron formation lenses): primarily nodular quartz-mica schist with lenses of silicate- and sulphide-facies iron formation and minor oxide-facies iron formation
Ac5: phyllite, greywacke

EARLY KENORAN (?) PLUTONIC ROCKS

Av — Mixed felsic to mafic tuffs

SYMBOLS

Geological contact: approximate, assumed

Outcrop

75 Bedding: inclined, vertical

85 Schistosity: inclined, vertical

Fault

Area covered by grid:
I SKI 1 grid
II SIK 1 grid
III R72 grid
IV Iyama Lake grid
V R66 grid
VI F5 grid

FIGURE 8-27: Geology of the F, SIK and SKI claims. 1983 to 1985 grids are shown.

DLER, JOHN, SHIN CLAIMS

Hecla Mining Company	Gold
of Canada Ltd.	76 E/10,14-16
P.O. Box 49200	65°44′22″-65°54′28″N,
Bentall Postal Station	110°29′38″-111°00′04″W
Vancouver, B.C., V7X 1L1	

REFERENCES

Bostock (1980); Fraser (1964); Tremblay (1976).
DIAND assessment reports: 017119, 017120, 017154, 017156, 017162, 017167, 081974.

PROPERTY

DLER 1-4; JOHN 2-7, 8-12; SHIN 1-19.

LOCATION

The claims are 390 km northeasterly from Yellowknife (Fig. 8-28).

HISTORY

The claims cover ground formerly held as Permits 33 (PP 76-E-10) and 35 (PP 76-E-15) by Canadian Nickel Company Ltd. from 1962 to 1964. An airborne magnetic survey was flown, and followed-up with detailed ground magnetic surveying and mapping (DIAND assessment reports 017119, 017120, 017154, 017156, 017162, 017167). The permits lapsed in 1964.
The SHIN claims were recorded in November, 1983; JOHN 1-7 in December 1984; JOHN 8-12 and DLER 1-4 in January 1985. They were subsequently transferred to Schindler Exploration Consultants Ltd., 305314 Alberta Ltd. and finally to Hecla Mining Company in July 1985.

DESCRIPTION

The area is underlain predominantly by Archean metasediments with intercalated iron formation lenses of the Contwoyto Formation, intruded by granitic dykes and plutons and diabase dykes.
Fraser (1964), Tremblay (1976) and Bostock (1980) mapped the area at 1:506,880, 1:50,000 and 1:250,000 scales respectively. The regional and claim geology are shown in Figures 8-28 and 8-29.

CURRENT WORK AND RESULTS

In 1985, helicopter-borne EM, magnetic and VLF surveys were flown over the DLER, JOHN 8-12, SHIN and JOHN 2-7 claims (3547 line km). A few moderate conductors were detected on the DLER, JOHN 8-12 and SHIN claims. Results of the survey over JOHN 2-7 were not received in time for this report.

AU 10, 13, 16, 27 CLAIMS

Bow Valley Industries Ltd.	Gold
2020-1177 W.	76 E/10,11
Hastings St.	65°40′30″N, 111°04′W
Vancouver, B.C., V6E 2K3	

REFERENCES

Bostock (1980); Seaton and Crux (1985); Tremblay (1976).
DIAND assessment reports: 081739, 081859.

PROPERTY

AU 10, 13, 16, 27.

LOCATION

The claims are 395 km northeasterly from Yellowknife, and include most of Shallow Bay on the west side of Contwoyto Lake (Figs. 8-28, 8-30).

HISTORY

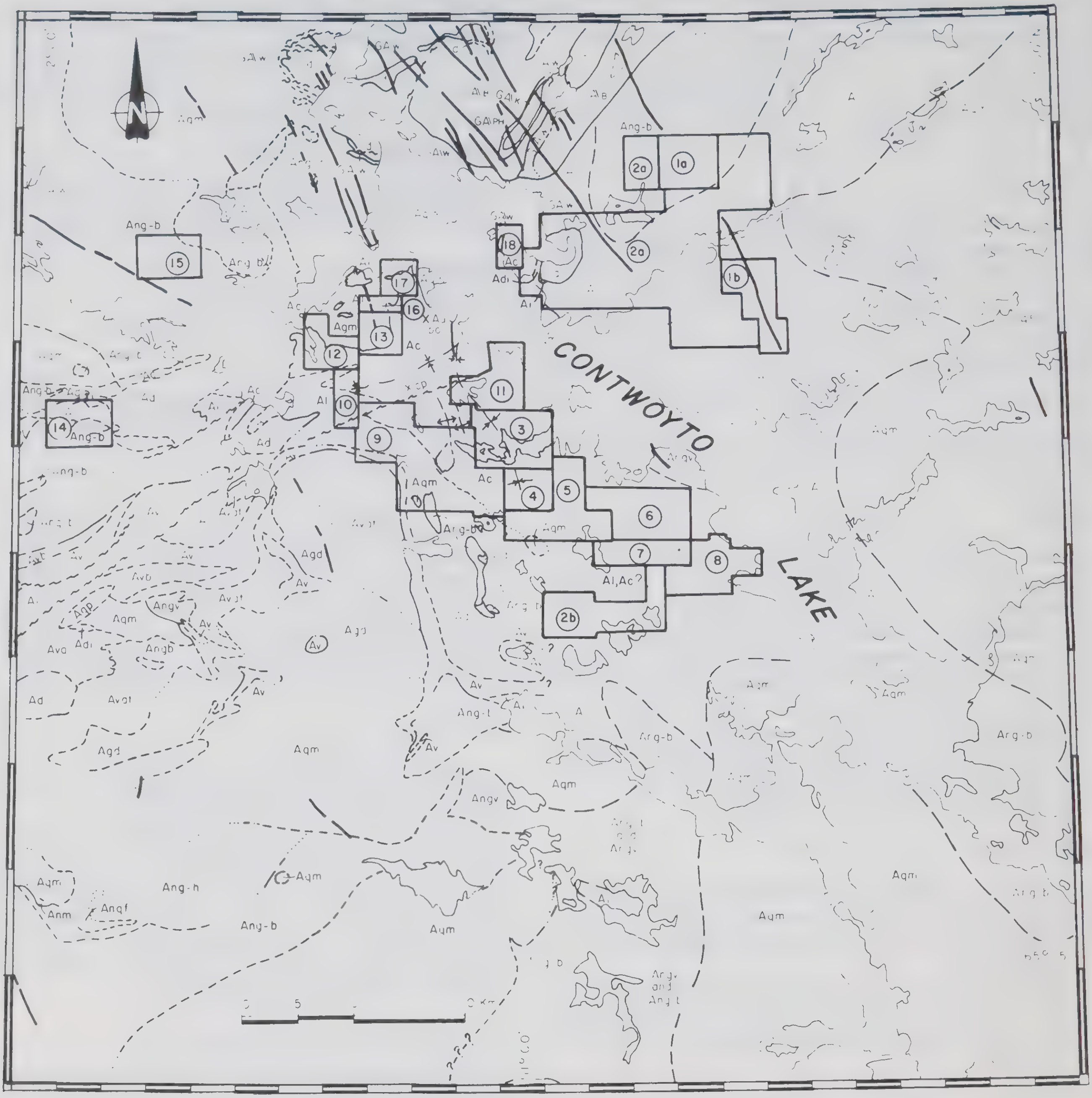
The exploration history of the area from 1960 to 1981 is summarized in Seaton and Crux (1985).
AU 10, 13, 16 and 27 were recorded in February 1981 for Hemisphere Development Corporation. Work done in 1983 included mapping and geophysical surveying (DIAND assessment report 081739; Seaton and Crux, 1985). The claims were optioned to Bow Valley Industries Ltd. in May 1984.

DESCRIPTION

Figures 8-28 and 8-30 show the regional geology of the area. Bostock (1980) and Tremblay (1976) mapped the area at 1:250,000 and 1:50,000 respectively.
The claims are underlain by Archean Yellowknife Supergroup metasediments, interbedded with silicate- and sulphide-facies iron formation, and minor intermediate volcaniclastics. A large syncline with a north-northwesterly trending fold axis extends through AU 10, 13, 14. Numerous northwesterly and north-northwesterly trending Proterozoic diabase dykes intrude the metasediments (Fig. 8-30).

CURRENT WORK AND RESULTS

In 1983, mapping and VLF-EM and magnetic surveying were done on Grids H-2, H-3 and H-4. In 1984, grid H-4 was extended to the south, east and north. In all, 279.86 line km of new grids were established and mapping and geophysical surveying were done over most of these. Five holes totalling 438.3 m were diamond drilled.
Work completed during the 1984 field season is summarized in Table 8-3.



PROPERTIES

1a	C 1	6	AU 23,24; KEG 1,2	13	WEST
1b	C 2-4	7	NC 1; PTC 1	14	SHARE
2a	DLER 1-4; JOHN 8-12; SHIN 1-19	8	CTL 1; DIGGER 1,2; SAM 1,2	15	RAFT
2b	JOHN 2-7	9	AU 4,5,7,11; BARB 1; KAP 1-3; MINER	16	WHY
3	AU 10,13,16,27	10	PIXIE	17	AU 1
4	AU 14,17	11	AU 6,8,9,12	18	GOLD 1
5	AU 15,18,19	12	AU 2,3		

FIGURE 8-28: Regional geology and properties of the Contwoyto Lake (Olga Lake) Supracrustal Belt (geology modified from Bostock, 1980), Tremblay, 1976) and Fraser, 1964).

LEGEND

d	Diabase, gabbro; dykes and sills.
	GOULBURN GROUP
GAK	KUUVIK FORMATION: limy and dolomitic rocks; minor siliceous and argillaceous material.
GAPH	PEACOCK HILLS FORMATION: red, grey, green and black argillites; pink quartzite.
GAB	BURNSIDE RIVER FORMATION: pink quartzite; minor quartz-pebble conglomerate; white quartzite
GAW	WESTERN RIVER FORMATION: argillite, greywacke, quartzite, siltstone.

LATE KENORAN PLUTONIC ROCKS

Aqm	Quartz-monzonite, granodiorite; some granite;
Adi	Diorite, granodiorite; some amphibolite;
	YELLOWKNIFE SUPERGROUP
Ai	ITCHEN FORMATION: metaturbidites lacking iron-formation lenses.
Ac	CONTWOYTO FORMATION: metaturbidites containing iron-formation lenses - argillite, siltstone, slate, greywacke.

EARLY KENORAN (?) PLUTONIC ROCKS

Agd	Granodiorite, quartz diorite, quartz-monzonite.
Aqp	Quartz porphyry.
Avb	POINT LAKE FORMATION: metavolcanic and related metasedimentary rocks tuffs, black slate.
Av	Mixed felsic to mafic tuffs; some amphibolite, hornblende gneiss, and calc-silicate rocks.
Ava	Felsic flows and tuffs.
Avat	Felsic tuffs; some felsic flows; includes mylonitized felsic rocks, possible felsic tuffs.

HYBRID ROCKS:

Ang-b	Lit-par-lit gneiss and schist mostly biotite-rich.
Angv	Felsic and/or mafic volcanic and hypabyssal rocks.
Ang-h	Diorite agmatitic, mafic volcanic rocks.
Anm	Hornblende gneiss, amphibolite intruded by Aqm.
Anqf	Quartz-feldspar gneiss.

SYMBOLS

Geological boundary (defined, approximate, assumed).

Fault.

Diabase dykes (exposed or geophysically interpreted).

Anticline.

Syncline.

X Au Mineral occurrence:
Au gold cp chalcopyrite.
po pyrrhotite.

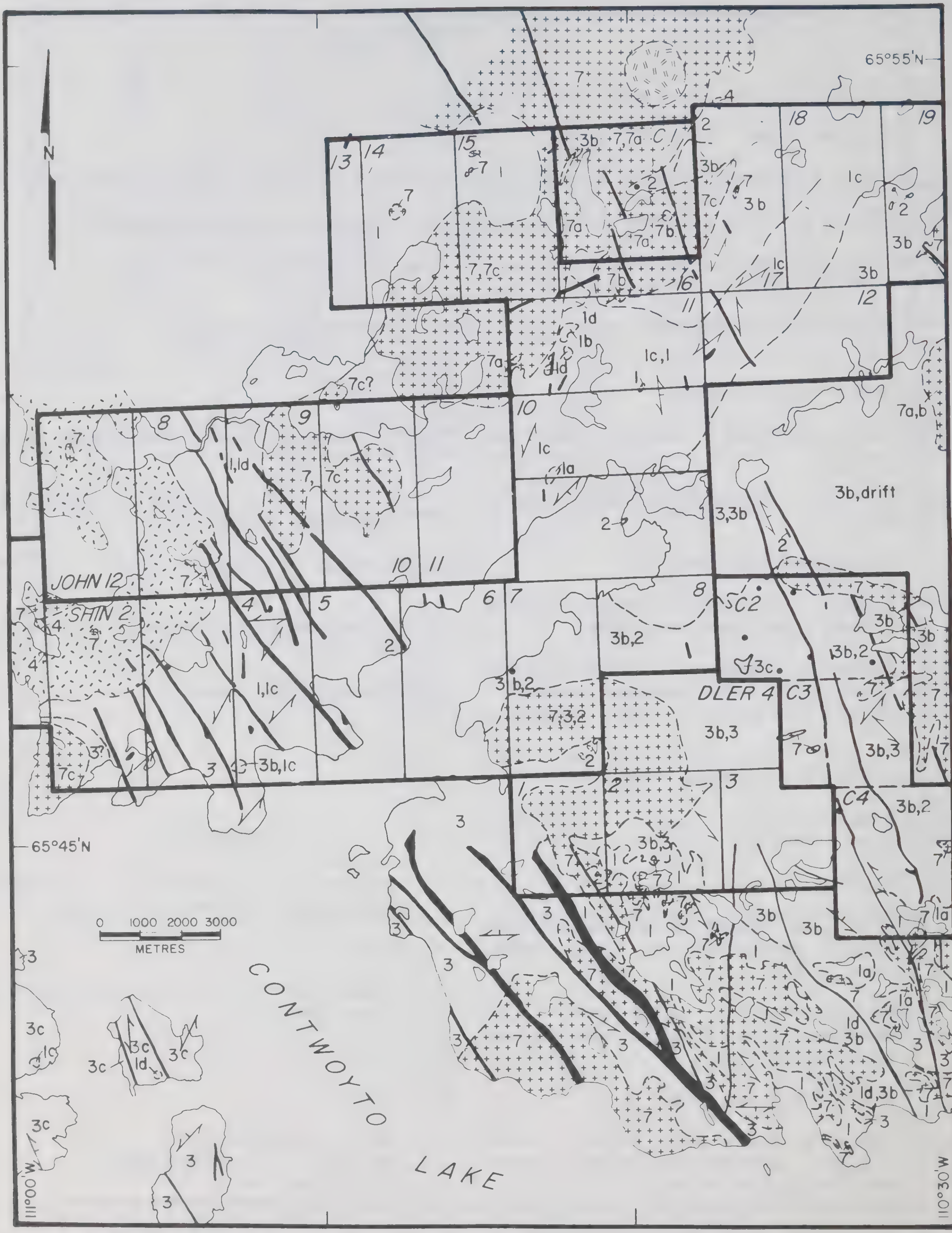
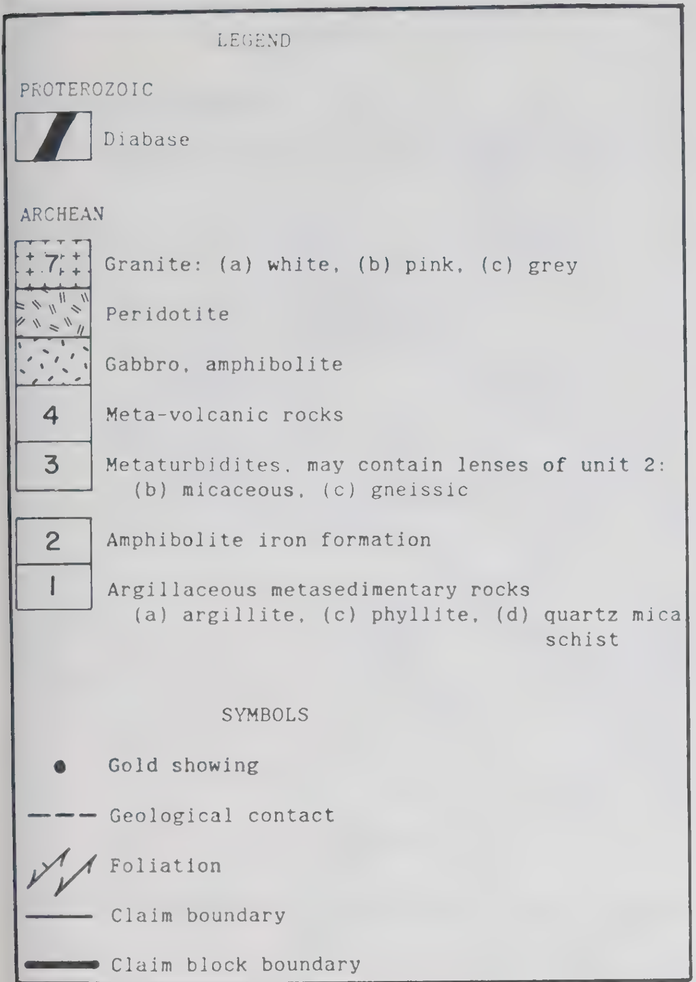


FIGURE 8-29: Geology of the C, DLER, JOHN and SHIN claims and gold showing locations (geology modified from DIAND assessment report 017207).



AU 14, 17 CLAIMS

Bow Valley Industries Ltd. — Gold
2020-1177 W. Hastings St. — 76 E/10,11
Vancouver, B.C., V6E 2K3 — 65°38′N, 111°01′W

REFERENCES

Bostock (1980); Fraser (1964); Schiller (1965); Seaton and Crux (1985); Tremblay (1976).

DIAND assessment reports: 017167, 081737, 081838

PROPERTY

AU 14, 17.

LOCATION

The claims are 390 km northeasterly from Yellowknife, 3 km south of Shallow Bay on the west side of Contwoyto Lake (Figs. 8-28, 8-30).

HISTORY

The exploration history of the area is described in Seaton and Crux (1985).

The claims were recorded in February 1981 for Viscount Resources Ltd. In 1983, the claims were mapped and geophysically surveyed (DIAND assessment report 081737; Seaton and Crux, 1985), and optioned to Bow Valley Industries Ltd. in December.

DESCRIPTION

The regional geology is shown in Figures 8-28 and 8-30. The area around the claim was mapped by Tremblay (1976) at 1:50,000, Fraser (1964) at 1:506,880, and in part by Bostock (1980) at 1:250,000,

The claims are underlain by Archean Yellowknife Supergroup metasediments, interbedded with silicate- and sulphide-facies iron formation, and minor intermediate volcaniclastics.

CURRENT WORK AND RESULTS

In 1984, mapping, geophysical surveying and diamond drilling were done.

Three grids were constructed on the claims in 1984: V-3 grid (88.2 line km on AU 14,17), part of the V-4 grid (19.76 line km on AU 17) and part of the SB-2 grid (9 line km on AU 14).

Geological mapping, total field and vertical gradient magnetic and VLF surveying at 1:2000 scale were conducted over each grid. Mapping was not completed on the V-4 grid. The results of the surveys are shown in Table 8-4.

AU 15, 18, 19 CLAIMS

Cominco Ltd. — Gold
Suite 700, 409 Granville St. — 76 E/10,11
Vancouver, B.C., V6C 1T2 — 65°36′N, 111°00′W

REFERENCES

Bostock (1980; Fraser (1964); Seaton and Crux (1985); Tremblay (1976).

DIAND assessment reports: 081735, 081870, 081951, 081952.

PROPERTY

AU 15, 18, 19.

LOCATION

The claims are 390 km northeasterly from Yellowknife and south of Shallow Bay in the Contwoyto Lake area (Figs. 8-28, 8-31).

HISTORY

The exploration history of the AU 15 area, including work done during 1983 (DIAND assessment report 081735), is summarized in Seaton and Crux (1985).

The claims were recorded in February, 1981 and were explored in 1984 by Amhawk Resources Corporation by agreement with the Kanwood Syndicate. The claims were optioned from Amhawk Resources to Cominco Ltd. in 1985.

DESCRIPTION

The regional geology is shown in Figures 8-28 and 8-31. The area has been mapped at 1:250,000 by Bostock (1980),

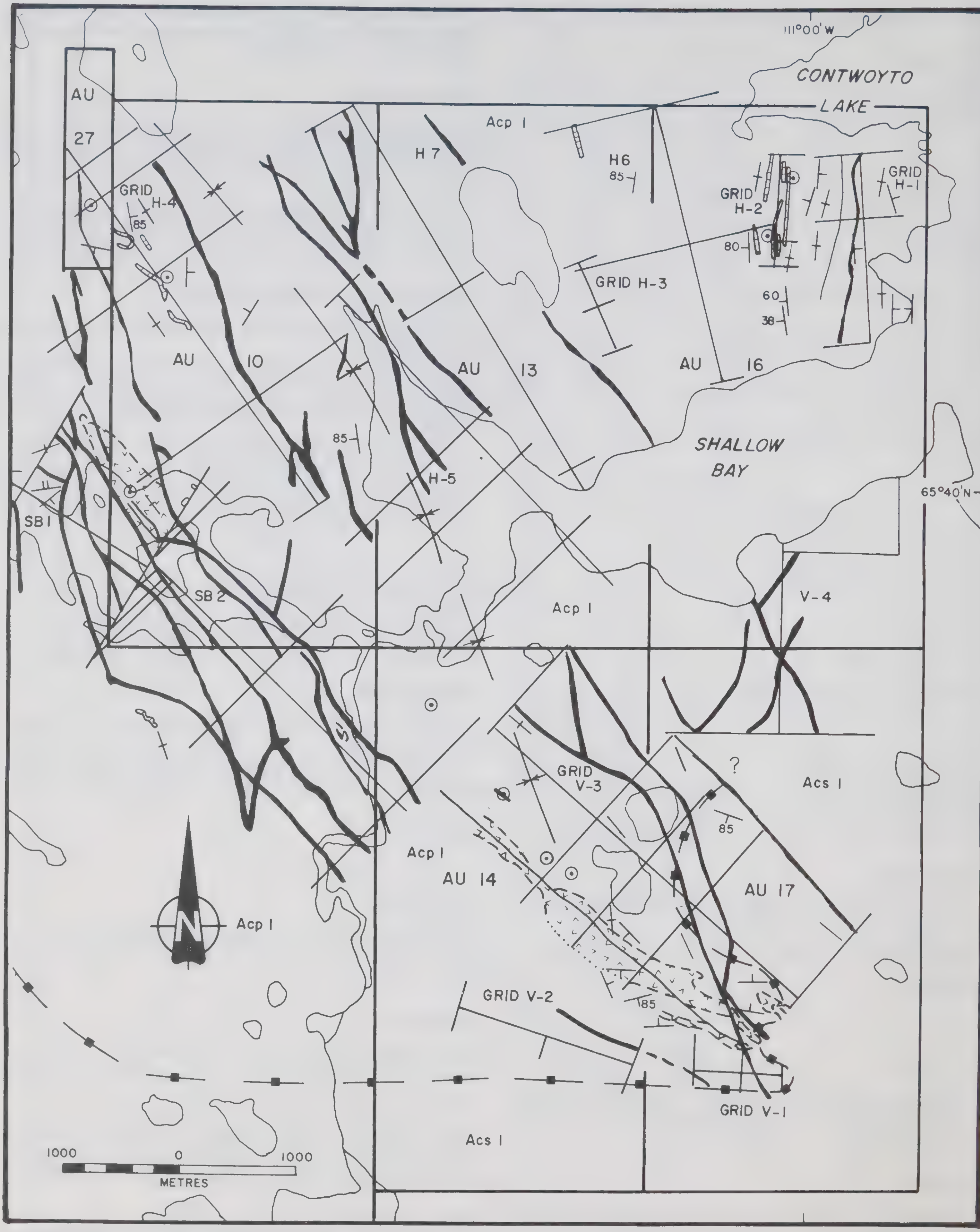


FIGURE 8-30: Geology of the AU 10, 13, 16, 27 and AU 14, 17 claims.

LEGEND

PROTEROZOIC

Diabase, gabbro; dykes and sills; may be interpeted from geophysical data.

ARCHEAN

Ac Contwoyto Formàtion: (metaturbidites containing iron formation lenses): Acp 1: argillite siltstone, slate, greywacke; some impure quartzite; with grunerite-sulphide iron formation lenses.

Acs 1: nodular quartz-plagioclase biotite schist and gneiss; greywacke; minor graphite schist; with grunerite-sulphide iron formation lenses.

Grunerite-sulphide iron formation.

Intermediate tuff with scattered felsic lapilli, occasional amphibole-chlorite-biotite-ash fragments ± pyrrhotite, pyrite, bornite.

SYMBOLS

Geological boundary.

Bedding, tops known: inclined.

Bedding, tops unknown: inclined, vertical, dip unknown.

Anticline.

Approximate upper limit of greenschist facies (first appearance of cordierite).

Diamond drill hole location.

Grid location.

Tremblay (1976) at 1:50,000 and Fraser (1964) at 1:506,880.

The claims are underlain predominantly by Contwoyto Formation nodular quartz-plagioclase-biotite schists with andalusite, cordierite and staurolite porphyroblasts (Fig. 8-31). Lenses of amphibolitic, locally garnetiferous, silicate-facies iron formation are present within the Contwoyto Formation metasediments. A small pluton of granite intrudes the metasediments in the southern part of AU 15. Northwesterly trending diabase dykes intrude all rock units.

CURRENT WORK AND RESULTS

1984:

A grid was constructed covering AU 15 and part of AU 19 (Fig. 8-31).

Yellowknife Supergroup metasediments underlie most of the grid, except for the southern margin, which is underlain by coarse grained muscovite granite.

The Yellowknife Supergroup metasediments are mainly nodular, biotite, cordierite- or andalusite- bearing schists. Amphibolite or metamorphosed iron formation outcrops locally. The iron formation is, in places, auriferous and is associated with a number of moderate, discrete magnetic highs that trend west-northwesterly across the grid in an en echelon pattern. Northwesterly to north-northwesterly trending diabase dykes produce much stronger and more continuous positive magnetic responses.

VLF results indicate folds with west-northwesterly trending axial planes.

1985:

Detailed geological mapping was done at 1:1000 scale on the Amwood E and S grids (Fig. 8-31). Chip samples were taken from old trenches (Robert's Mining Company, 1963 in Tremblay, 1976) and outcrops of iron formation.

AU, KEG CLAIMS

Cominco Ltd.	Gold
Suite 700, 409 Granville St.	76 E/10
Vancouver, B.C., V6C 1T2	65°37′N, 110°50′W

REFERENCES

Bostock (1980); Fraser (1964); Tremblay (1976).

DIAND assessment reports: 017119, 017120, 017167, 081945, 081952.

PROPERTY

AU 23, 24; KEG 1, 2.

LOCATION

The claims are 375 km northeasterly from Yellowknife (Fig. 8-28).

HISTORY

Prospecting Permit 33 (PP 76-E-10) was granted to Canadian Nickel Company Ltd. in 1962. An aeromagnetic survey was done over the permit in 1962. Follow-up geological mapping and geophysical surveys over detailed grids were done from 1962 to 1964. Three such grids were on ground now held as KEG 2, AU 23, 24. The permit lapsed in 1964 (DIAND assessment reports 017119, 017120, 017167).

AU 23, 24 were recorded in February 1981. They were transferred to Westsun Petroleums and Minerals Ltd. in May 1984 and then to Highwood Resources Ltd. in May 1985.

KEG 1, 2, were recorded in July, 1983 and then optioned by Cominco Ltd.

DESCRIPTION

The area has been mapped by Fraser (1964), Tremblay (1976) and Bostock (1980) at 1:506,880, 1:50,000 and 1:250,000 respectively. Regional and claim geology are shown in Figures 8-28 and 8-32.

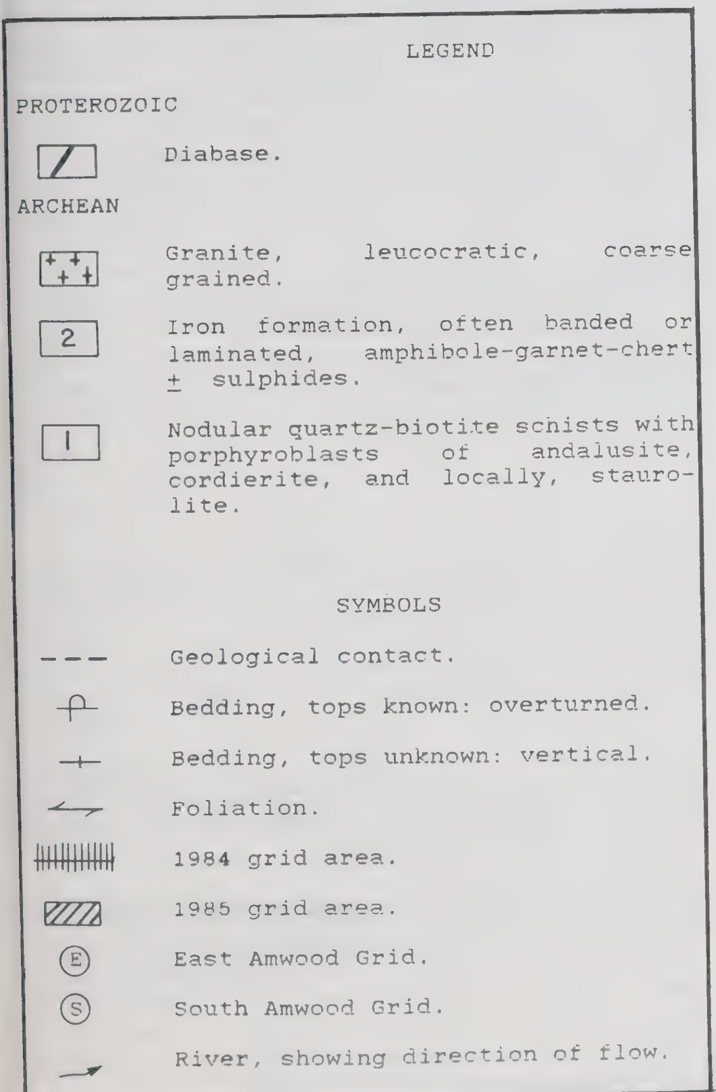
Archean Yellowknife Supergroup metasediments and iron

TABLE 8-3: SUMMARY OF 1984 WORK DONE ON AU 10, 13, 16 AND 27.

Grid	Claim	Geology at 1:2000 scale (Fig. 8-30)	Magnetic Surveys	VLF-EM	Diamond Drilling (Fig. 8-30)	Economic Minerals
H-2 (1983) grid	AU 16			1983: used Seattle transmitting station; 1984: used Annapolis: results similar to 1983: iron formation associated with very weak discontinuous conductors	2 holes (172.82 m), both drilled at approximate angle of 45ºE: 1) tested an outcropping iron formation at depth 2) tested strong magnetic anomaly & weak VLF conductor; intersected 2 zones of iron formation	gold occurs sporadically in silicate facies iron formation & appears to be associated with pyrrhotite & arsenopyrite
H-3 (1983) grid	Au 13	80% of the grid area is covered by overburden; area is underlain by argillites & greywackes of upper greenschist facies; bedding trends NNW; several small lenses of silicate facies iron formation in NE part of grid; 4 grab samples taken				0.34 g/t Au or less
H-4 re-est & expanded in 1984 58.66 lkm	AU 10; AU 7, 27 (in part)	mapping not completed; outcrop exposure good in northern & northwestern part of grid; sediments with iron formation & some intermediate volcaniclastics	vertical gradient & total field; iron formation correspond with weak, linear, positive anomalies	used Seattle transmitting station; 2 moderate to strong conductors, 1 coincident with a magnetic anomaly	2 holes (162.8 m): 1) tested coincident magnetic/VLF anomalies 2) tested an iron formation outcrop at depth	concentrations range from 0.10 to 1.26 g/t Au over 0.95 m (true width); gold is associated with pyrrhotite & chalcopyrite in iron formation
H-5 41.62 lkm	AU 13; AU 10 (part)	outcrop exposed on 1% of grid area; outcrop & felsenmeer: diabase, argillite & greywacke; bedding strikes N, dips subvertically	vertical gradient & total field over northern half of grid; weak anomaly possibly caused by iron formation	not completed for northern half of grid VLF in southern part, over land area only; used Cutler station		
H-6 36.72 lkm	AU 13; AU 16	outcrop exposed on 40% of grid area; underlain by argillite & greywacke with interbedded, discontinuous layers & lenses of iron formation containing variable amounts of sulphides & magnetite	vertical gradient & total field, numerous spot highs- cause unknown; 1 weak anomaly corresponds to a VLF conductor	a moderate to strong conductor coincides with various magnetic responses in the southern part of grid; used Cutler station		6 grab samples taken of sulphidic iron formation; assays range from 0.10 to 0.34 g/t Au; associated with pyrite, pyrrhotite & chalcopyrite
H-7 59.44 lkm	AU 13; AU 10 (part) AU 12 (part)		several isolated magnetic dipoles & weak spot highs, possibly indicative of iron formation	3 weak responses coincident with magnetic responses; used Cutler station		
SB-1 East 41.52 lkm SB-1 and SB-2	Au 10 (part) rest on Au 7 SB-1 East Detail btwn lines 7+20 E 9+60 E, 5+60 N to Shallow Bay shoreline	scattered outcrops & felsenmeer; believed underlain by greywackes interbedded with argillites; in NE area, intermediate volcaniclastics and N to NNW trending diabase dykes; bedding strikes NNW, dips steeply to NE	one strong anomaly is coincident with a weak VLF conductor; caused by diabase dyke cutting volcanics	anomalies correspond with mag, detailed VLF rerun using Cutler station (results were negative;) diamond drilled this anomaly, also weak responses corresponding with mag under Shallow Bay	1 hole (102.72 m), intersected a narrow zone of pyrrhotite-bearing, mafic to intermediate lapilli tuffs	tuff assayed 0.10 g/t Au
SB-2	AU 10 (part) rest AU 11, 14	scattered outcrops & felsenmeer; believed underlain by greywackes interbedded with argillites		used Annapolis station; weak conductor coincident with magnetic anomaly		
V-4 41.90 lkm	52% on AU 17 rest on AU 16		most responses due to diabase dykes; several weak responses may be due to iron formation	broad, weak response coincident with magnetic anomaly, believed to be pyrite/pyrrhotite or graphite within iron formation		

TABLE 8-4: SUMMARY OF 1984 WORK DONE ON AU 14, 17.

Grid	Claim	Geology	Geophysics: Magnetic	Geophysics: VLF	Diamond Drilling	Mineralization
BF	AU 14, 17	Refer to Figure 8- . The intermediate tuffaceous volcanics appear to form limb of ESE-trending synform. Iron formation outcrops near sediment/volcanic contact and appears to be folded about E-W trending axes.	Readings every 10 m. Weak response to iron formation which may correspond to a weak VLF response	Readings every 20 m. Weak to moderate response with coinciding magnetic trend may indicate iron formation	3 holes (221.9 m), tested geophysical anomalies; iron formation intersected in all holes; Sulphide minerals are pyrrhotite, pyrite. Assays from 0.1 to 2.94 g/t Au over 0.5 m	Gold is in iron formation associated with pyrite, hematite, magnetite, 1.60 to 8.35 g/t Au.
SB-2	AU 14 (part) 9.0 km or 12.2% of grid	no outcrop on AU 14 part of grid. Drilling intersected metasediments of upper greenschist facies	Indicated 2 NW-trending diabase dykes. Possible iron formation indicated by weak dipoles	One weak response flanking magnetic dipole-possibly iron formation	1 hole, 54 m, tested magnetic peak. Iron formation with pyrrhotite intersected. Low gold values	Weak gold concentrations associated with 1 to 5% pyrrhotite in iron formation
V-4	AU 17 (part) 19.76 km or 45% of grid		Numerous weak dipoles possibly indicative of iron formation	One moderate response flanking magnetic dipole-possibly indicating iron formation		



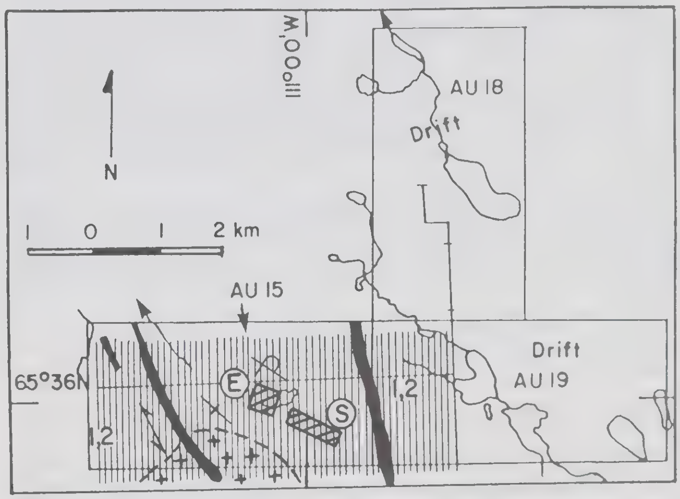


FIGURE 8-31: Geology of the AU 15, 18, 19 claims showing 1984 and 1985 grids.

formation underlie most of the claim area. The iron formation is amphibolitic and garnetiferous, locally with chlorite, pyrite, arsenopyrite and native copper. Overburden covers much of the northern and central areas of the claims (Fig. 8-32).

CURRENT WORK AND RESULTS

Airborne EM and magnetic surveying were done over the claims in 1985.

A grid, totalling 75 line km, was set up over KEG 2 and AU 23, 24. Detailed VLF and magnetic surveying and mapping were done. The VLF survey outlined several conductors in areas of overburden.

The claims were mapped at 1:2500 scale. Chip and grab samples from all iron formations were assayed for gold.

NC, PTC CLAIMS

Cominco Ltd.
Suite 700, 409 Granville St.
Vancouver, B.C., V6C 1T2

Gold
76 E/10
65°35′N, 110°50′W

REFERENCES

Bostock (1980); Fraser (1964); Tremblay (1976).
DIAND assessment reports: 017119, 017120, 017167, 081942, 081952.

PROPERTY

NC 1, PTC 1.

LOCATION

The claims are 395 km northeasterly from Yellowknife, west of Contwoyto Lake (Fig. 8-28).

HISTORY

From 1962 to 1964, Canadian Nickel Company Ltd. carried out reconnaissance and detailed geological mapping, aeromagnetic surveying and follow-up ground magnetic surveying on Prospecting Permit 33 (PP 76-E-10) which covered the area now staked as NC 1 and PTC 1. In 1963, on what is now NC 1, samples were taken and assayed for gold, with poor results. The permit lapsed in 1964 (DIAND assessment reports 017119, 017120, 017167).

No assessment work was reported on the claims from 1964 to 1983. In 1983, the claims were staked for Wellington Resources Ltd. (later becoming Gyro Energy and Minerals Corp.).

In 1984, the claims were acquired by Cominco Ltd. who is in joint venture with Cogema Ltee.

DESCRIPTION

The property is underlain predominantly by metamorphosed argillites and greywackes of the Yellowknife Supergroup (Figs. 8-28 and 8-32). Bedding and foliation trend northwesterly and dip steeply to the southwest. Outcrops of silicate-facies iron formation are in the northwest, south-central and southwestern parts of NC 1 and in the southwestern part of PTC 1. Small bodies of granite and northwesterly trending diabase dykes intrude the sediments.

Fraser (1964), Tremblay (1976) and Bostock (1980) mapped the area at 1:506,880, 1:50,000 and 1:250,000 respectively.

CURRENT WORK AND RESULTS

1983:

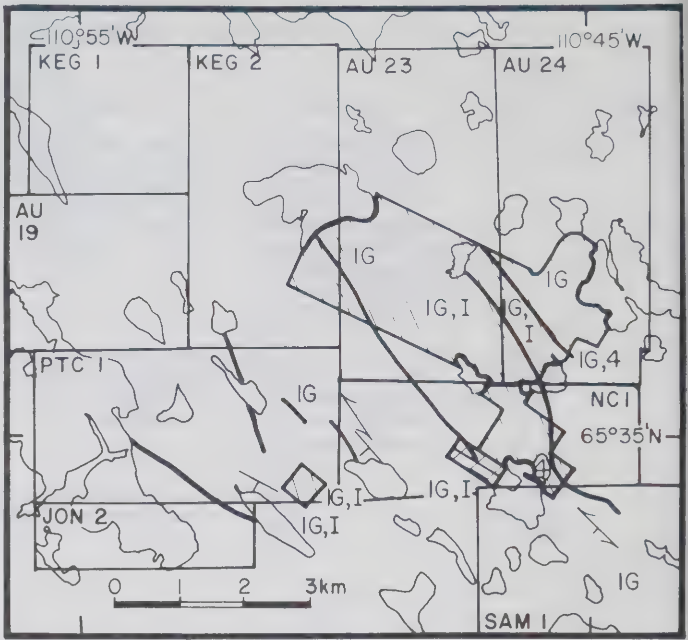
Reconnaissance mapping was done on NC 1. Iron formation was discovered in three areas. A grid was set up over the south-central iron formation, which is locally pyritiferous, and detailed geological mapping and geophysical surveying were carried out (Fig. 8-32). The VLF and magnetic surveys failed to give significant responses. Sampling of iron formation assayed up to 0.273 g/t Au.

1985:

Grids on NC 1 and PTC 1 were mapped in detail. VLF surveys were done on both grids; a magnetic survey was done on the PTC 1 grid (Fig. 8-32). Grab and chip samples of iron formation from both grids were assayed for gold.

The VLF survey outlined three conductors on the NC 1 grid. One is apparently due to sulphides in an iron formation; the causes of the other conductors are unknown. One conductor, believed to be an extension of sulphide-bearing iron formation, was delineated on the PTC 1 grid.

Airborne EM and magnetic surveys were also conducted over both claims. Several conductors were outlined.



LEGEND

PROTEROZOIC

Diabase.

ARCHEAN

4 Granite.

I Iron formation.

IG Nodular schists of the Contwoyto Formation.

SYMBOLS

Bedding, tops unknown, dip known.

Foliation: dip unknown, dip known.

Grid area: 1983.

Grid area: 1985.

FIGURE 8-32: Geology of the AU, KEG, NC, PTC SAM and JON claims and grid locations (geology modified from DIAND assessment reports 017120 and 081757).

CTL, DIGGER, SAM CLAIMS

Cominco Ltd. — Gold
Suite 700, 409 Granville St. — 76 E/10
Vancouver, B.C., V6C 1T2 — 65°34'N, 110°42'W

REFERENCES

Bostock (1980); Fraser (1964); Tremblay (1976).
DIAND assessment reports: 017119, 017120, 017167, 081943, 081944, 081952.

PROPERTY

CTL 1, DIGGER 1,2; SAM 1,2.

LOCATION

The claims are near the western shore of Contwoyto Lake, about 390 km northwesterly from Yellowknife (Fig. 8-28).

HISTORY

Prospecting Permit 33 (PP 76-E-10) was granted to Canadian Nickel Co. Ltd. in 1962. From 1962 to 1964, Canadian Nickel prospected, mapped and aeromagnetically surveyed the permit area. Detail grids were set up and detailed mapping, sampling and magnetic surveying done. Nine of these grids are within the present claim area. Samples from two of these, the Antler A and Drumlin A grids, returned assays of up to 2.40 g/t Au and 8.23 g/t Au, respectively (DIAND assessment reports 017119, 017120, 017167). The permit lapsed in 1964.

CTL 1 and DIGGER 2 were staked by Cominco in October 1983 and August 1985, respectively. DIGGER 1 and SAM 1, 2 were staked in March 1983 by P. Hungle. DIGGER 1 was transferred to D.G. Thomas in July 1983 and was acquired by Cominco in April 1985. SAM 1, 2 were transferred to Roxwell Gold Mines Ltd. in February 1984. Cominco acquired the claims in April 1985.

DESCRIPTION

The property is underlain primarily by Archean metasediments of the Yellowknife Supergroup, with lenses of garnet- and amphibole-rich iron formation. Granitic and diabase dykes intrude the sediments (Figs. 8-28, 8-33). The region has been mapped by Fraser (1964), Tremblay (1976) and Bostock (1980) at 1:506,880, 1:50,000 and 1:250,000 respectively.

CURRENT WORK AND RESULTS

Grids were set up over CTL 1, DIGGER 1 and SAM 1,2 in 1985 and detailed geological mapping, sampling and VLF and magnetic surveying were done. Numerous VLF conductors coincident with iron formation were delineated.

Airborne EM and magnetic surveying were also done in 1985, over all the claims.

AU, BARB, KAP, MINER CLAIMS

Bow Valley Industries Ltd. — Gold
2020-1177 W. Hastings St. — 76 E/11
Vancouver, B.C., V6E 2K3 — 65°40'N, 111°12'W

REFERENCES

Baragar and Hornbrook (1963); Bostock (1980); Schiller and Hornbrook (1964); Seaton (1978); Seaton and Crux (1985); Tremblay (1976).
DIAND assessment report: 081862.

PROPERTY

AU 4,5,7,11; BARB 1; KAP 1-3; MINER.

LOCATION

The claims are 300 km north-northeasterly from Yellowknife and west of Shallow Bay, Contwoyto Lake (Figs. 8-28, 8-34).

HISTORY

Gold discoveries in the area in 1960 by the Canadian Nickel Company Ltd. resulted in a staking rush in 1961. Most of these claims lapsed by 1973 (Baragar and Hornbrook, 1963; Schiller and Hornbrook, 1964; Tremblay, 1976). The ground was restaked in 1974. These claims lapsed in 1976 (Seaton, 1978). A detailed exploration history of the area is given in Seaton and Crux (1985).

BARB 1 was recorded by P. Hungle in December 1980 and transferred to Barren Lands Exploration Services Ltd. in February 1981. It was then transferred to Highwood Resources Ltd. in January 1983. In February of 1981, AU 4, 5, 7, 11 were recorded for Highwood Resources Ltd. Both the BARB and AU claims were transferred to Kappa Resources Ltd. in February 1983, and then to Bow Valley Industries in April 1984.

KAP 1, 3 and KAP 2, MINER were recorded by P McKay and F. Diamond'C respectively in March 1983, and transferred to Bow Valley Industries in April 1984. Work done in 1983 is summarized in Seaton and Crux (1985).

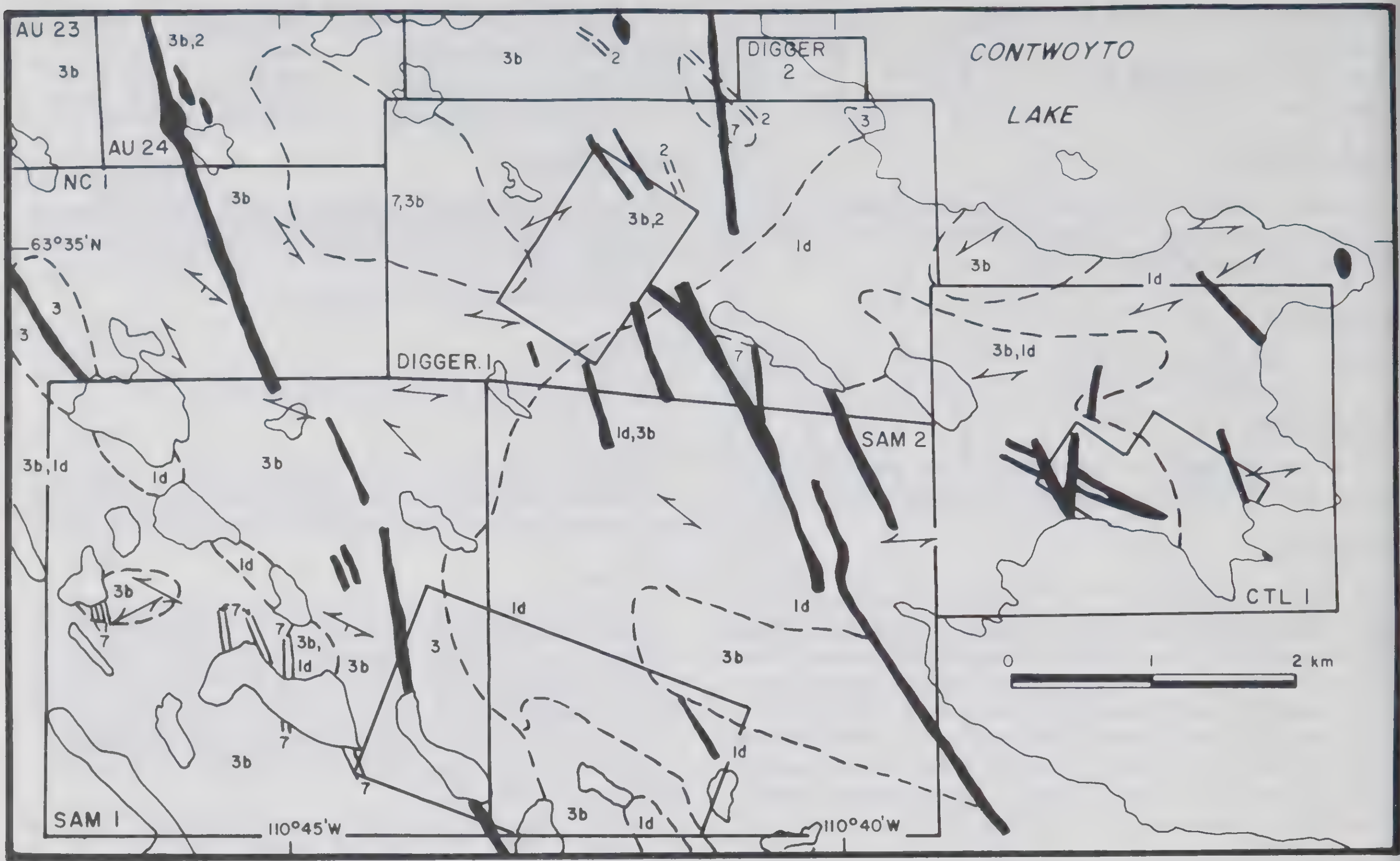
DESCRIPTION

The regional geology of the claims is shown in Figures 8-28, and 8-34. The claims are predominantly underlain by Archean Yellowknife Supergroup metasediments with interbedded lenses of amphibolitic, silicate- and oxide-facies iron formation. Lower grade metasediments underlie the northeastern half of the claim block. Volcaniclastic tuffs and porphyries are in the southwest corners of MINER, KAP 1 and KAP 2. A small syenite stock intrudes the sediments in the central part of BARB 1. The Norma Fault trends northeast across the northwest corner of AU 4. Numerous Proterozoic diabase dykes intrude all rock types.

Bostock (1980) and Tremblay (1976) mapped the area at 1:250,000 and 1:50,000 respectively.

CURRENT WORK AND RESULTS

Work carried out over the claims in 1984 is summarized in Table 8-5. The work comprised mapping, diamond drilling and total field magnetic, vertical gradient and VLF surveying on



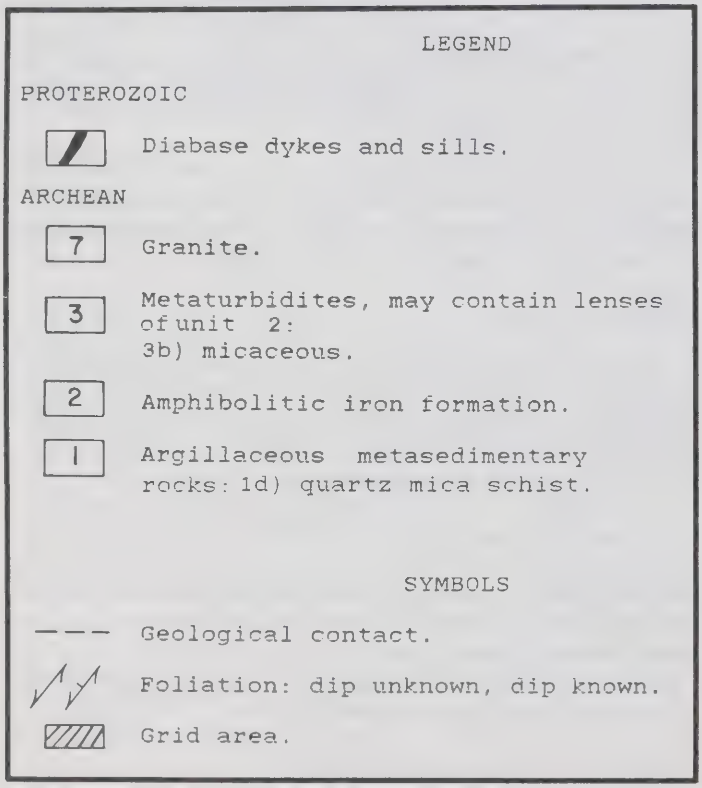


FIGURE 8-33: Geology of the CTL, DIGGER and SAM claims (geology modified from DIAND assessment report 017120).

grids shown in Figure 8-34. Gold appears to be associated with pyrite and/or pyrrhotite and, locally, arsenopyrite in silcate- facies or oxide-facies iron formation. The iron formation may or may not be garnetiferous.

PIXIE CLAIM

Bow Valley Industries Ltd.	Gold
2020-1177 W. Hastings St.	76 E/11
Vancouver, B.C., V6E 2K3	65°42'30''N, 111°21'W

REFERENCES

Bostock (1980); Fraser (1964); Tremblay (1976).

DIAND assessment reports: 017161, 017200, 017203, 017205, 017210, 060330, 082047.

PROPERTY

PIXIE.

LOCATION

The claim is 390 km northwesterly from Yellowknife (Fig. 8-28).

HISTORY

In 1962, the area now held as PIXIE was part of five claim groups: the JE group, owned by the Earl-Jacks Syndicate; the BAR and SP groups, owned by the Big Four Syndicate;

TABLE 8-5: SUMMARY OF 1984 WORK DONE ON AU, BARB, KAP AND MINER CLAIMS.

Grid	Claim	Geology (mapping at 1:2000 unless otherwise stated)	Magnetic Surveys	VLF-EM	Diamond Drilling	Mineralization
P-1 (covers 1963 PAN showing, PAN claims	BARB 1		to outline extensions of iron formation; intersected by ddh P-9-84-iron formation does not appear to be continuous with the PAN showing		6 holes (393.56 m), to systematically test PAN iron formation at 20 m & 50 m vertical depth	garnet-poor, pyrrhotite-rich iron formation contains the highest gold concentrations; highest assays: 7.36 g/t Au over 3.58 m & 2.80 g/t Au over 2.87 m
K-3	AU 4				1 hole (61.9 m) to test coincident VLF & magnetic responses associated with iron formation	2 iron formations intersected contain negligible gold
P 3 (new)	BARB 1 KAP 3 (part)	outcrop or felsenmeer exposed on 20% of grid; NE part underlain by syenite & SE part by greywacke and iron formation	1:2000; magnetic response flat except over iron formation, syenite or diabase	1:2000; flat response; one broad anomaly possibly due to iron formation	1 hole (60.40 m) to test iron formation at depth; 1.5 m wide (true) garnetiferous iron formation with pyrite & pyrrhotite	grab samples of iron formation assayed from 1.57 to 3.25 g/t Au; gold associated with pyrite, arsenopyrite & locally pyrrhotite
K 6	KAP 3	N part mapped at 1:2000 & detailed grid area at 1:1000; underlain by meta-greywacke, meta-argillite & a thin zone of iron formation	1:1000; diabase & iron formation better defined at this scale	iron formation is a strong conductor	2 holes (142.05 m); one to test an iron formation sampled in 1983; the other to test an iron formation sampled in 1984	gold associated with pyrrhotite, pyrite & locally arsenopyrite. One iron formation has high gold content
K 7 (new)	KAP 3	underlain by metasediments with one thin unit of iron formation	1:2000; iron formation gives spot highs & has discontinuous magnetic expression	1:2000; iron formation is strongly conductive	2 holes (138.42 m) to test iron formation at depth	grab samples assayed up to 1.33 g/t Au; gold is associated with arsenopyrite, pyrrhotite & minor pyrite
K-9 (new)	AU 4	underlain by metasediments with several iron formation lenses, which locally contain garnets & sulphides	1:2000; most iron formation has weak response; one iron formation has strong response but is barren of gold	1:2000; iron formation is weakly to moderately conductive		gold, varying concentrations, associated with pyrite, pyrrhotite & arsenopyrite
BLG (new)	AU 5 AU 4 BARB 1	underlain mainly by overburden, lakes & swamps; in NE part volcaniclastic tuff interfingered with metasediments; iron formation garnetiferous & pyritiferous with minor arsenopyrite, pyrrhotite, chalcopyrite & malachite	1:2000; numerous magnetic dipoles, possibly indicative of iron formation	1:2000; 2 surveys over E part of grid- used Annapolis & Cutler stations; Central & W parts of grid surveyed using Annapolis station	1 hole (101.1 m) to test strong VLF response; intersected diabase & sulphide-rich metasediments	Assays ranged from 0.10 to 1.02 g/t Au
SB-1 East; W includes (West Inclined Detail and West Detail Detail grid	AU 7 (also part of AU 10)	mapping at 1:2000 & 1:500; Shallow Bay covers SW half of grid; tuffs & porphyries are in N part of grid, sediments with iron formation towards the S & W parts; no garnets in iron formation	1:2000, 1:100; iron formation has weak discontinuous response; stronger response caused by magnetite in iron formation	1:2000; 1:500; weak conductive zones reflect sulphidic iron formation & tuffs	14 holes (1218.09 m) to test auriferous showings; several silicate-oxide facies & silicate-sulphide facies iron formations intersected at depth	gold concentrations vary; some visible gold
SB-2	AU 11 (also part of AU 10, 14)	most of area covered by water, swamps & over-burden grid area is underlain by tuff, metasediments & granetiferous iron formation	1:2000; iron formation gives weak magnetic response	1:2000; broad weak conductive zones possibly indicative of		gold is associated with pyrite & arseno-pyrite in iron formation

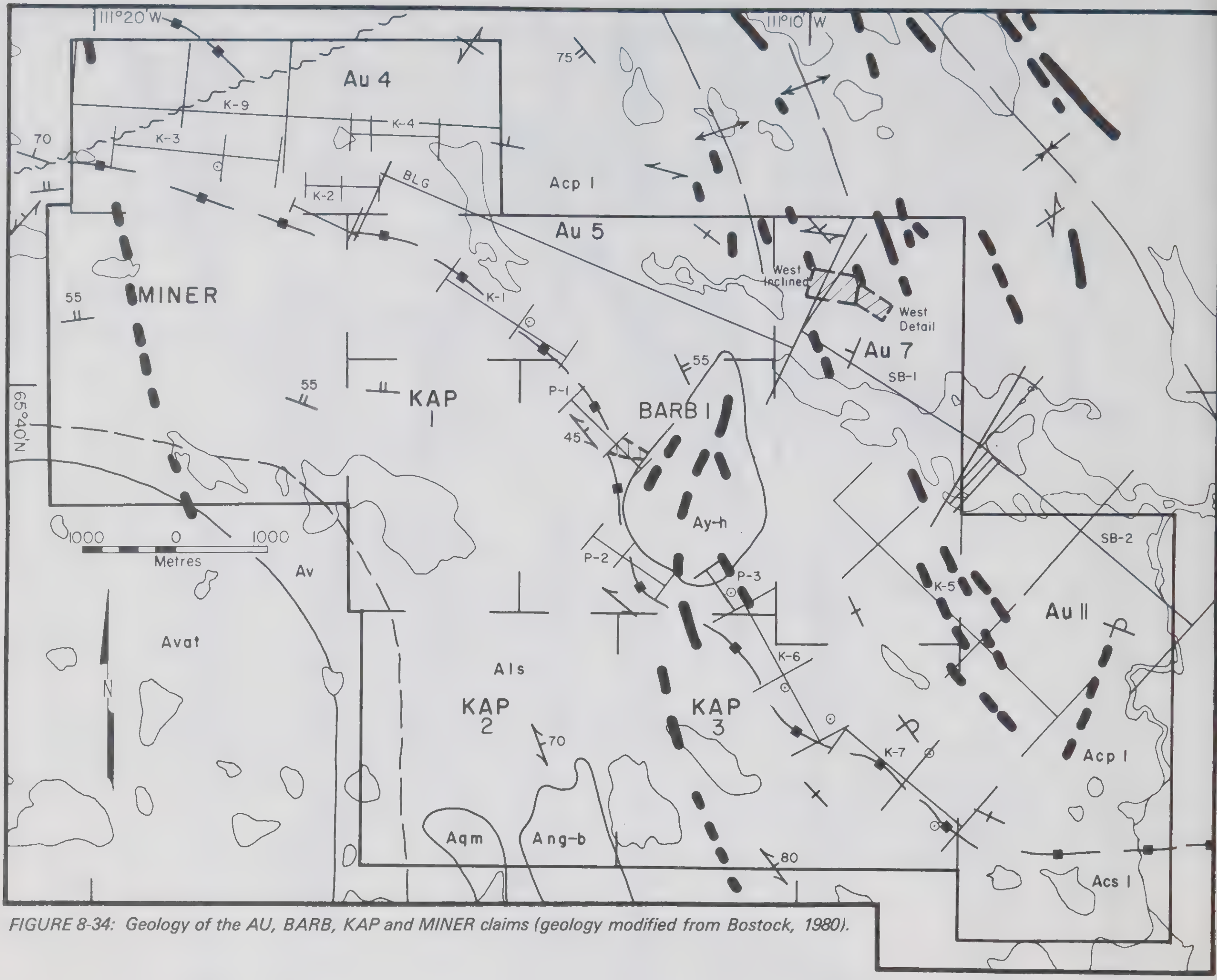


FIGURE 8-34: Geology of the AU, BARB, KAP and MINER claims (geology modified from Bostock, 1980).

and the NOR and GUN groups, owned by North Goldcrest Mines Ltd. All were staked in 1962. Work done on the claims in 1962 (except for the BAR group - 1962 and 1963) included mapping, prospecting, trenching and EM surveying (DIAND assessment reports 017161, 017200, 017203, 017205, 017210, 060330).

PIXIE was recorded in March 1983 by P. McKay and transferred to Rockridge Mining Corporation in 1984. Bow Valley optioned the claim in 1985.

DESCRIPTION

The regional and claim geology are shown in Figures 8-28 and 8-35. Yellowknife Supergroup metaturbidites underlie PIXIE. Greenschist facies rocks are in the northern third of the claim; amphibolite facies in the southern two-thirds. Sulphide-facies iron formation is intercalated with the metasediments. The Norma Fault trends northeasterly across the southeastern corner of the claim.

Fraser (1964), Tremblay (1976) and Bostock (1980) mapped the area at 1:506,880, 1:50,000 and 1:250,000 respectively.

CURRENT WORK AND RESULTS

Airborne INPUT EM and magnetic surveys, flown over 53 line km, delineated three anomalous zones. A grid was set up over each zone (Fig. 8-35) and follow-up detailed ground magnetic, VLF and HLEM surveys, mapping and sampling were done. Six diamond drill holes, totalling 503 m, tested geophysical anomalies; four of these intersected sulphide-facies iron formation. Numerous grab and core samples were analyzed for gold. Grab sample assays were low, but core sample assays were better.

LEGEND

PROTEROZOIC

Diabase, gabbro; dykes and sills; may be interpreted from geophysical data.

ARCHEAN

Aqm	Quartz-monzonite, granodiorite; some granite.
Ay-h	Hornblende syenite.
Als	Itchen Formation: nodular quartz-plagioclase-biotite schist and gneiss, greywacke; minor concretionary greywacke.
Acp l	Contwoyto Formation: argillite siltstone, slate, greywacke; some impure quartzite, calcareous argillite with lenses of grunerite-sulphide iron formation.
Acs l	Contwoyto Formation: nodular quartz-plagioclase-biotite schist and gneiss, greywacke; minor graphite schist; with grunerite-sulphide iron formation lenses.
Av	Mixed felsic to mafic tuffs; some amphibolite, hornblende gneiss and calc-silicate rocks.
Avat	Felsic (quartz-sodic plagioclase) tuffs; some felsic flows.

HYBRID ROCKS

Ang-b	Lit-par-lit gneiss and schist, mostly biotite-rich; some hornblende-biotite gneiss.

SYMBOLS

Geological boundary: defined, approximate.

Bedding, tops known: inclined, overturned.

Bedding, tops unknown: inclined, vertical.

Schistosity, cleavage: horizontal, vertical, dip unknown.

Fault.

Diamond drill hole.

Syncline, anticline.

Mineral isograd: approximate upper limit of greenschist facies (first appearance of cordierite).

Grid area.

Area of detailed drilling.

AU 6, 8, 9, 12

Bow Valley Industries Ltd.	Gold
2020-1177 W. Hastings St.	76 E/11
Vancouver, B.C., V6E 2K3	65°43′N, 111°07′W

REFERENCES

Baragar and Hornbrook (1963); Bostock (1980); Schiller and Hornbrook (1964); Tremblay (1976).

DIAND assessment reports: 017104, 017211, 017231, 081889.

PROPERTY

AU 6, 8, 9, 12.

LOCATION

The claims (Fig. 8-28) are 390 km northeasterly from Yellowknife and roughly 5 km southeast of Lupin Mine. They form a block extending from Fingers Lake to Contwoyto Lake.

HISTORY

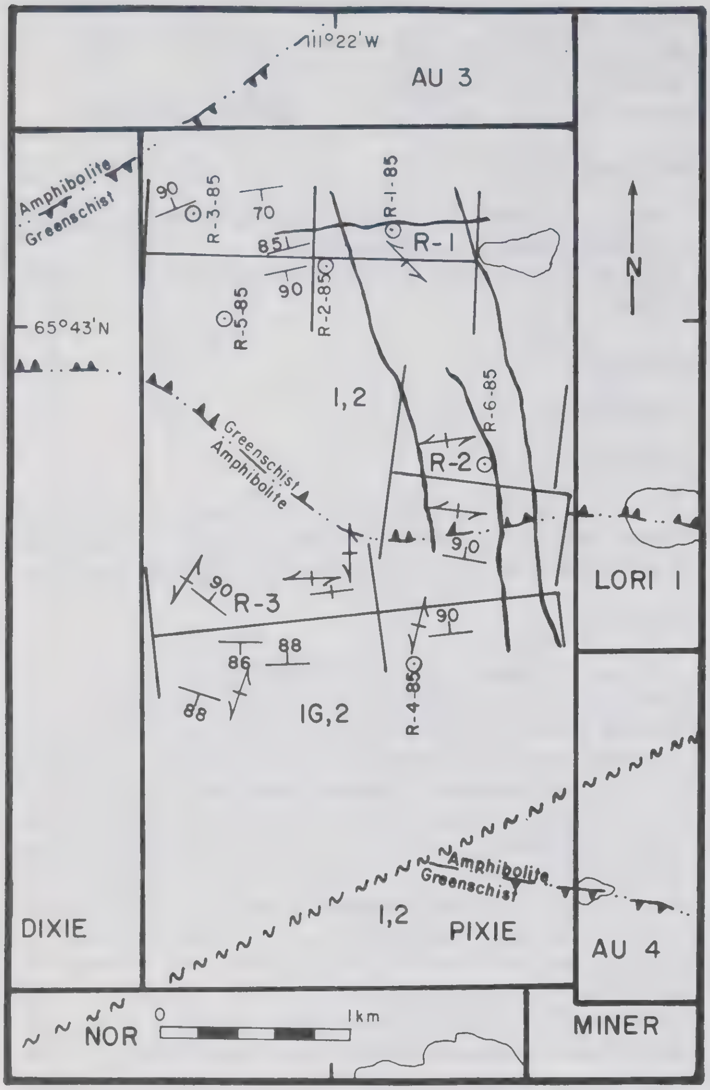
Following discovery of gold, in 1960, by Canadian Nickel Company Ltd., at what is now Lupin Mine, the area was extensively staked. The AU 6, 8, 9, 12 claim block covers part of ground staked in the early sixties as the BOX, FOX and BAY groups, staked by Conwest Exploration Co. Ltd. and Earl-Jacks Syndicate respectively. The FOX and BOX claims were subsequently optioned to Falconbridge Nickel Mines Ltd. The BAY group was optioned to a group of companies that included Faraday Uranium Mines Ltd., Amalgamated Larder Mines Ltd., Gunnex Ltd. and Rayrock Mines Ltd. (Baragar and Hornbrook, 1963; Schiller and Hornbrook, 1964). From 1961 to 1964 these claims were explored by prospecting, geological mapping, trenching, diamond drilling, and magnetic surveying. A mineralogical study was also done (DIAND assessment reports 017104, 017211, 017231; Tremblay, 1976).

Many of the claims recorded during the sixties' staking rush eventually lapsed. Part of this ground was restaked as AU 6, 8, 9, 12 in February 1981 and acquired by Great Bear Development Corporation, which geologically reconnoitred the claims prior to optioning them to Bow Valley Industries Ltd. in the fall of 1983.

DESCRIPTION

The area was mapped at 1:250,000 by Bostock (1980) and at 1:50,000 by Tremblay (1976).

The property is underlain by greenschist facies metasediments of the Contwoyto Formation of the Yellowknife Supergroup (Figs. 8-28 and 8-36). In the southern part of the property, the metasediments are folded about a northwesterly plunging axis. The axial zone of the fold passes under Fingers Lake and occupies much of AU 6. To the east, on AU 9, 12, on the eastern limb of the fold, bedding strikes north-northwesterly with steep to vertical dips. The east-northeasterly trending Norma Fault passes through the north-western corner of AU 6, and the northern parts of AU 9, 12, and is marked by a pronounced change in strike of bedding,



LEGEND

PROTEROZOIC

Diabase.

ARCHEAN

1 Greywacke, crudely foliated, massive to bedded; argillite, chloritic, locally graphitic.

2 Nodular biotite schist with cordierite and andalusite porphyroblasts, well foliated.

IG Iron formation, locally banded with amphibole or garnet, rarely with sulphides.

SYMBOLS

70 90 Bedding, tops known: inclined, vertical.

Foliation: vertical.

Norma Fault.

Metamorphic isograd, teeth on lower grade side.

Diamond drill hole.

Grid area.

FIGURE 8-35: Geology of the PIXIE claim.

which on AU 8 and the northern part of AU 9, 12 is northeasterly.

The Contwoyto Formation comprises greywacke and argillite with lenses of iron formation. Only a few argillite with lenses have been reported on the property, mainly on AU 8, 12. Though sulphide-bearing iron formation is commonly auriferous on properties nearby, on AU 6, 8, 9, 12 the highest assay obtained during propecting by Falconbridge in 1962 was 1.2 g/t Au, with other samples assaying 0.3 g/t Au or less. No iron formation has been found on AU 6.

CURRENT WORK AND RESULTS

Two grids were established: the FL-1 Grid, 51.64 line km, and the FL-2 Grid, 7.93 line km (Fig. 8-36). Together the grids cover most of Fingers Lake and AU 6; the eastern part of the FL-2 grid is on AU 9.

Geological mapping, total field and vertical gradient magnetic and VLF surveying were done on the grids. The grids are underlain by greywacke and argillite, which are, locally, graphitic. Pyrite and pyrrhotite locally give rise to rusty patches.

Most of the strong magnetic features on the grids are caused by diabase dykes that strike northwesterly and presumably belong to the Helikian Mackenzie Swarm. Two short, northeasterly trending, linear magnetic features north of Fingers Lake were interpreted to be caused by iron formation, as were a few other weak and non-conductive magnetic highs.

A non-magnetic conductor north of Fingers Lake may be caused by suphide- or graphite-bearing metasediments.

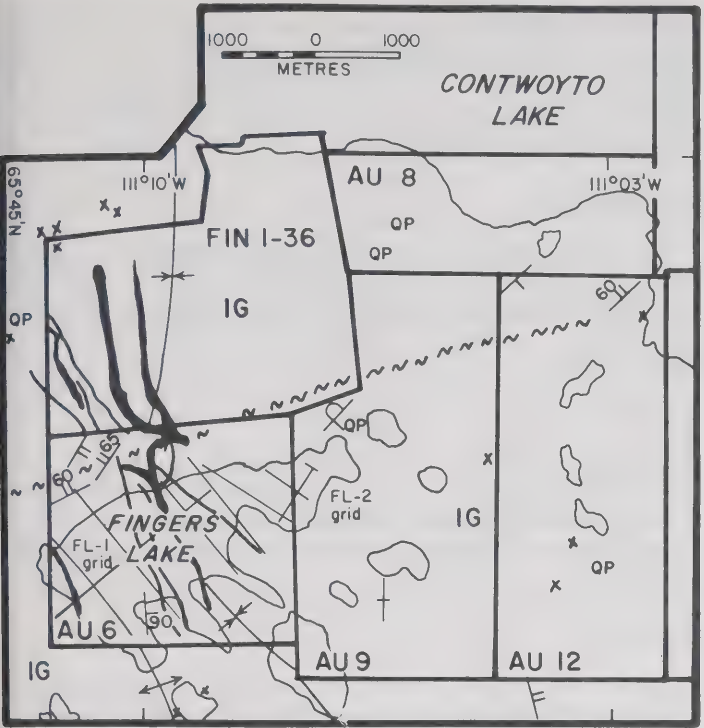
The majority of VLF anomalies are thought to be caused by conductive Quaternary lake sediments.

AU 2, 3 CLAIMS

Bow Valley Industries Ltd	Gold
2020-1177 W. Hastings St.	76 E/11,14
Vancouver, B.C., V6E 2K3	65°44'30''N, 111°24'W

REFERENCES

Bostock (1980); Seaton and Crux (1985); Tremblay (1976).
DIAND assessment reports: 081740, 081857.



LEGEND

PROTEROZOIC

Diabase.

ARCHEAN

YELLOWKNIFE SUPERGROUP

IG — Predominantly greywacke and argillite of greenschist facies metamorphic grade, locally interbedded with bands of iron formation and quartz-feldspar porphyry (QP).

SYMBOLS

Bedding, tops known: inclined, vertical, overturned.

Bedding, tops unknown: inclined, vertical.

Fault.

Syncline, anticline.

QP — Outcrops of quartz-feldspar porphyry.

x — Outcrops of garnet-grunerite gneiss (iron formation).

FIGURE 8-36: Geology of the AU 6, 8, 9, 12 and FIN claims (geology modified from DIAND assessment report 081889 and Tremblay, 1976).

PROPERTY

AU 2,3.

LOCATION

The claims are 395 km northeasterly from Yellowknife, in the vicinity of Sun Bay on Contwoyto Lake (Figs. 8-28,8-37).

HISTORY

The exploration history of the area is presented in Seaton and Crux (1985).

AU 2, 3 were recorded in February 1981 for Great Bear Development Corporation and are under option to Bow Valley Industries Ltd. In 1983, mapping and geophysical surveys were done (DIAND assessment report 081740; Seaton and Crux, 1985).

DESCRIPTION

The regional geology is shown in Figures 8-28 and 8-37. The claims are underlain by greenschist and amphibolite facies metasediments of the Yellowknife Supergroup. Numerous lenses of silicate-facies iron formation trend easterly within the metasediments. A granitic pluton covers the northern part of the claims.

Bostock (1980) and Tremblay (1976) mapped the area at 1:250,000 and 1:50,000 respectively.

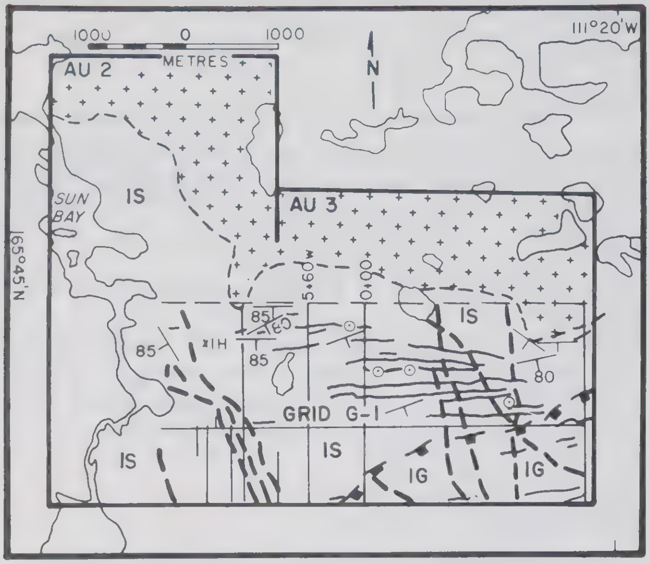
CURRENT WORK AND RESULTS

Work begun in 1983 over the G-1 grid, including magnetic, VLF and geological surveying, was completed during the 1984 field season. A total of 28.56 line km of VLF, using the Cutler transmitting station, was carried out over the western part of the G-1 grid. A moderate, east-trending conductor at the south end of the grid, delineated in 1983, was found to continue to the west. Several other weak to moderate conductors coincide with weak to strong magnetic responses. These are interpreted to be due to iron formation. Numerous north-northwesterly trending dykes were outlined by the magnetic surveys.

Geological mapping, begun in 1983 over the western part of the G-1 grid, was completed. The grid is underlain predominantly by amphibolite facies nodular schists. In the southeast part of the grid, the greywackes and argillite are greenschist facies. Numerous lenses and bands of iron formation are interbedded with the sediments (Fig. 8-37). Bedding strikes predominantly east and dips steeply to the south. Over 150 grab samples of iron formation were assayed for gold; 14 samples assayed greater than 1.0 g/t Au. Gold is associated with banded pyrrhotite and arsenopyrite. A small frost-heaved area of intermediate tuffaceous volcanics is exposed on the west end of the grid. Intermediate volcanics were also intersected in drill holes.

The northeast corner of the grid is underlain by coarse-grained leucocratic granite. Numerous small granitic dykes intrude the sediments throughout the grid area.

Five holes totalling 291.74 m, were drilled on AU 3 to test known iron formation at depth. One hole tested a strong VLF anomaly coincident with a magnetic anomaly. Two holes intersected iron formation at depth; assays are 1.99 g/t Au over 0.96 m and 1.12 g/t Au over 1.02 m.



LEGEND

PROTEROZOIC

Diabase, gabbro dykes and sills; may be interpreted from geophysical data.

ARCHEAN

Granite: coarse grained to pegmatitic, leucocratic, biotite-muscovite assemblage.

IH Intermediate volcanics: andesitic tuff, amygdaloidal andesitic flows, porphyritic andesite ± pyrrhotite, pyrite.

Iron formation: rusty weathering, silicate-facies, amphibole-quartz-chlorite ± garnet, epidote, feldspar and sulphides.

IG Greywacke, argillaceous greywacke: medium to fine grained, weakly foliated, often siliceous.

IS Nodular schists with cordierite ± andalusite, staurolite porphyroblasts, well foliated.

SYMBOLS

Geological contact.

Bedding, tops unknown: inclined.

Metamorphic isograd: boxes on low grade side.

Diamond drill hole.

Grid location.

FIGURE 8-37: Geology of the AU 2, 3 claims.

WEST CLAIM

Western Canadian Mining (WCM) Ltd.	Gold
Suite 2000,	76 E/11,14
1055 W. Hasting St.	65°45'N,
Vancouver, B.C., V6E 3V3	111°20'W

REFERENCES

Baragar and Hornbrook (1963); Bostock (1980); Tremblay (1976).

DIAND assessment reports: 017209, 081895, 081915.

PROPERTY

WEST.

LOCATION

The claim is approximately 400 km north-northeasterly from Yellowknife near the northwestern shore of Contwoyto Lake (Fig. 8-28).

HISTORY

The ground now held as WEST was staked in the early sixties as part of the Big Four Syndicate's RY claims and the Earl-Jacks Syndicate's BL claims, on NTS 76 E/14, and the Canadian Nickel Company Ltd.'s MOP claims on NTS 76 E/11. No work has been recorded for the RY claims. On the BL and MOP claims, geological mapping, prospecting and geophysical surveying were done in 1962 (Baragar and Hornbrook, 1963; DIAND assessment report 017209).

WEST was staked by P. McKay and transferred to C.W. O'Sullivan in 1983. Consort Energy Corporation acquired the property in 1984. In 1985, the property was transferred to Brinco Ltd., who in turn transferred the claim to their subsidiary, Western Canadian Mining (WCM) Limited, in 1986.

DESCRIPTION

The regional geology was mapped by Bostock (1980) and Tremblay (1976) at 1:50,000 and 1:250,000 respectively, and is shown in Figures 8-28 and 8-38.

The area is underlain by granodioritic rocks in the northwestern portion of the claim and by metasediments of the Yellowknife Supergroup in the southern and eastern sections (Fig. 8-38). Bedding trends north-northeasterly to northeasterly and dips steeply to the southeast. Numerous narrow zones of silicate-facies iron formation are interbedded with the sediments. These zones are locally sulphidic with pyrrhotite, pyrite and minor arsenopyrite and magnetite.

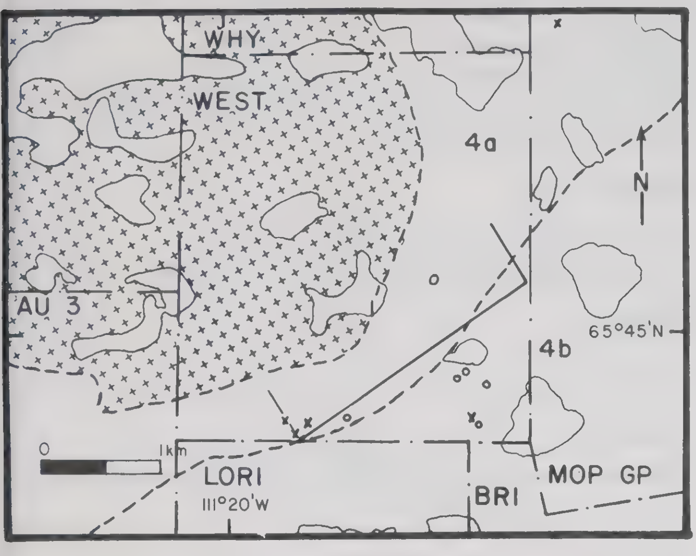
CURRENT WORK AND RESULTS

1984:

The 1984 work was done for Consort Energy Corporation and included detailed geological mapping and magnetic and VLF surveying on a grid set up over the metasediments (Fig. 8-38). Grab samples of iron formation were analyzed for gold. Assays ranged from less than 0.10 to 0.82 g/t Au. The magnetic and VLF surveys outlined several iron formations.

1985:

Chip, grab and core sampling of iron formations and dia-



LEGEND

ARCHEAN

Granite.

YELLOWKNIFE SUPERGROUP

4a Nodular quartz-biotite schist.

4b Argillite, greywacke.

SYMBOLS

Geological contact.

1985 diamond drill hole locations.

Iron formation outcrops (from Tremblay, 1976).

Grid location.

FIGURE 8-38: Geology of the WEST claim, showing iron formation outcrops and 1985 drill holes (geology from Tremblay, 1976).

mond drilling were done for Brinco Ltd. Six holes totalling 400 m were drilled. Five holes tested geophysical anomalies; one tested iron formation at depth. All holes intersected iron formation with varying concentrations of gold. Tungsten was found in one hole.

SHARE CLAIM

Echo Bay Mines Ltd.
3300 Manulife Place
10180-101st St.
Edmonton, Alta., T5J 3S4

Gold
76 E/12
65°41'N, 111°52'W

REFERENCES

Bostock (1980)
DIAND assessment reports: 017131, 017137, 017141, 081971.

PROPERTY

SHARE 1.

LOCATION

The claim is 380 km northeasterly from Yellowknife (Fig. 8-28).

HISTORY

In 1962, Prospecting Permit 34 (PP 76-E-12) was granted to Canadian Nickel Co Ltd. and an airborne magnetic survey was flown. From 1962 to 1964, the permit was geologically mapped, and locally mapped, sampled and magnetically surveyed in detail. Some holes were diamond drilled, but not on the ground now staked as SHARE 1 (DIAND assessment reports 017131, 017137, 017141).

SHARE 1 was staked in 1983 for Echo Bay Mines by Trigg, Woollett Consulting Ltd. to cover a visible-gold showing.

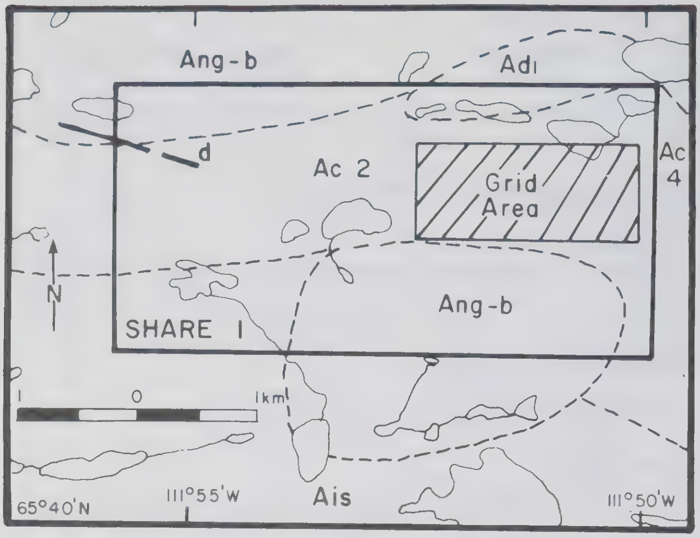
DESCRIPTION

The regional geology is described by Bostock (1980) and is shown in Figure 8-28. Claim geology is shown in Figure 8-39. The claim is underlain primarily by Contwoyto Formation metasediments, with intercalated sulphide-, silicate- and oxide-facies iron formation lenses and minor granodiorite.

CURRENT WORK AND RESULTS

1983:
Prospecting, geological mapping, trenching and sampling were done. Two gold showings were discovered, one in a quartz vein, the other in silicate-facies iron formation. Six trenches were excavated and channel samples taken. Assays of over 200 channel and grab samples ranged from less that 2.0 to 7.2 g/t Au. A grid was set up and a detailed magnetic survey conducted. Six magnetic anomalies were found, all coincident with iron formation.

1984:
Prospecting, geophysical surveying and diamond drilling were done. The 1983 grids were re-established and magnetic, VLF, SP and Max-Min surveys carried out. Four holes were drilled, totalling 451.52 m. One hole tested a visible-gold showing; the others tested magnetic anomalies. Seventy-seven grab samples and 214 core samples of iron formation were analyzed for gold.



LEGEND

PROTEROZOIC

d	Diabase.

ARCHEAN

Adi	Diorite, granodiorite; some medium grained amphibolite, minor banded amphibolite.
Ang-b	Lit-par-lit gneisses; biotite schists with iron formation lenses; granitic rocks containing "rafts" of metasedimentary rocks including iron formation.

YELLOWKNIFE SUPERGROUP

Ais	Itchen Formation (metaturbidites lacking iron formation lenses): nodular quartz-plagioclase-biotite schist and gneiss, greywacke.
Ac	Contwoyto Formation (metaturbidites containing iron formation lenses): Ac 2: silicate facies iron formation. Ac 4: oxide-facies iron formation.

SYMBOLS

--- Geological contact.

1983/84 grid area.

FIGURE 8-39: Geology of the SHARE claim (geology modified from Tremblay, 1976 and Bostock, 1980).

RAFT CLAIMS

Echo Bay Mines Ltd.
3300 Manulife Place
10180-101st St.
Edmonton, Alta., T5J 3S4

Gold
76 E/13
65°48'N, 111°43'W

REFERENCES

Bostock (1980); Seaton (1984).
DIAND assessment reports: 081201, 081896.

PROPERTY

RAFT 1.

LOCATION

The claim is 395 km northeasterly from Yellowknife, to the northwest of Lupin Mine (Fig. 8-28).

HISTORY

Prospecting Permit 651 was granted to Texasgulf Inc. in 1980. The north part of the permit was mapped and prospected to find copper-tungsten showings in granodiorite. No work has been recorded for the area now staked at RAFT 1 (Seaton, 1984; DIAND assessment report 081201). The permit was relinquished in January 1982.

RAFT 1 was staked in June 1983, after the discovery of auriferous iron formation in the area. It was staked by Trigg, Woollett Consulting Ltd. for Echo Bay Mines Ltd.

DESCRIPTION

The regional and claim geology are shown in Figures 8-28 and 8-40. The area was mapped by Bostock (1980) at 1:50,000.

The claim is underlain predominantly by Late Kenoran quartz monzonite and Archean metasediments of the Yellowknife Supergroup containing lenses and rafts of iron formation. In places, the sediments and igneous rocks exhibit a lit-par-lit gneissic texture, which was mapped as a hybrid rock by Bostock (1980).

CURRENT WORK AND RESULTS

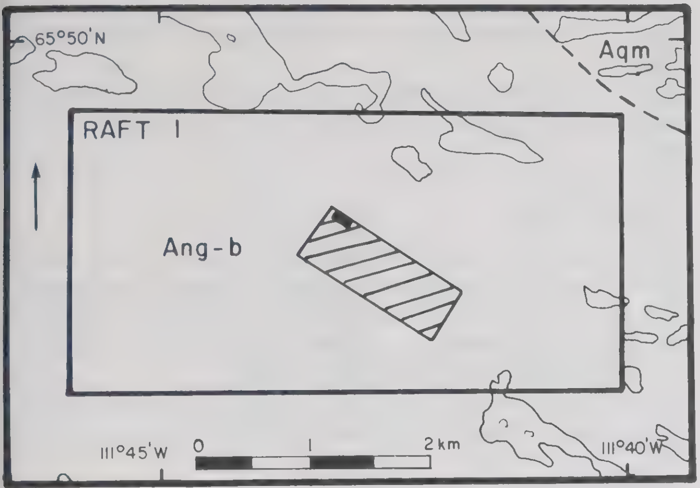
1983:

A grid (16 line km) was established over iron formation lenses within quartz monzonite and detailed prospecting and geological mapping done. Three auriferous iron formations were discovered; two were trenched and magnetically surveyed. One iron formation exhibited a strong magnetic signature; the other was magnetically flat. Five trenches were excavated and channel sampled. Grab and channel samples were analyzed for gold. Assays ranged from less than 2.0 to greater than 40.0 g/t Au.

1984:

A magnetic survey and diamond drilling tested an auriferous iron formation that was discovered in 1983. A strong magnetic anomaly outlined over the iron formation is probably due to magnetite.

Four holes, totalling 353.60 m, were drilled to test the iron formation. Core samples were assayed for gold, but the assays were not as high as those from surface.



LEGEND

ARCHEAN

Aqm — Quartz monzonite, granodiorite; some granite.

Ang-b — Lit-par-lit gneisses; biotite schists with iron formation lenses; granitic rocks containing "rafts" of metasedimentary rocks including iron formation.

SYMBOLS

Geological contact.

1983 grid - geology.

1983/84 grids - detailed geology, magnetic surveying and trenching.

FIGURE 8-40: Geology of the RAFT claim (geology modified from Tremblay, 1976 and Bostock, 1980).

WHY CLAIM

Argonaut Resources Ltd.	Gold
2nd Floor, 73 Water St.	76 E/14
Vancouver, B.C., V6B 1A1	65°47'N, 111°18'W

REFERENCES

Baragar and Hornbrook (1963); Bostock (1980); Fraser (1964); Tremblay (1976).

DIAND assessment reports: 017148, 017345, 082042.

PROPERTY

WHY.

LOCATION

The claim is approximately 400 km northeasterly from Yellowknife on the northwestern shore of Contwoyto Lake (Fig. 8-28).

HISTORY

The ground covered by the present WHY claim was previously staked as part of the BL claims and the SUN, WHITE and ESK claims in the early sixties. The BL claims were owned by the Earl-Jacks Syndicate. The area was mapped, prospected and geophysically surveyed in 1962 (Baragar and Hornbrook, 1963). The ESKIMO property (SUN, WHITE and ESK claims) was owned by the Eskimo Syndicate and optioned to Giant Yellowknife Mines in 1962. The claims were mapped and trenched in 1962 and magnetically surveyed in 1963. The option was dropped that year (DIAND assessment reports 017148, 017345).

WHY was staked by F. Diamond'C and recorded in March 1983. The claim was transferred to Argonaut Resources Ltd. in April 1984.

DESCRIPTION

The claim is underlain by Contwoyto Formation metasediments and iron formation, which are intruded by diabase dykes and granitic dykes and plutons (Figs. 8-28 and 8-41). The geology was mapped by Fraser (1964), Tremblay (1976) and Bostock (1980).

CURRENT WORK AND RESULTS

An airborne INPUT EM and magnetic survey, totalling 60 line km, was flown over the claims. Two weak conductors, interpreted to be caused by bedrock, were outlined.

AU 1 CLAIM

Bow Valley Industries Ltd.	Gold
2020-1177 W. Hastings St.	76 E/14
Vancouver, B.C., V6E 2K3	65°48'N, 111°17'W

REFERENCES

Bostock (1980); Fraser (1964); Tremblay (1976).

DIAND assessment reports: 017129, 017153, 017232, 081849.

PROPERTY

AU 1.

LOCATION

The claim is approximately 395 km northeasterly from Yellowknife and 5 km northwesterly from Lupin Mine (Figs. 8-28, 8-41).

HISTORY

The ground was staked in 1961 as the DALE claims and the MOP claim group.

The DALE claims were staked by Conwest Exploration Company Ltd. and optioned to Falconbridge Nickel Mines Ltd. In 1962, the claims were mapped (DIAND assessment report 017129); the claims were dropped soon after.

The MOP group was staked for Canadian Nickel Company Ltd. and geological mapping and geophysical surveying were

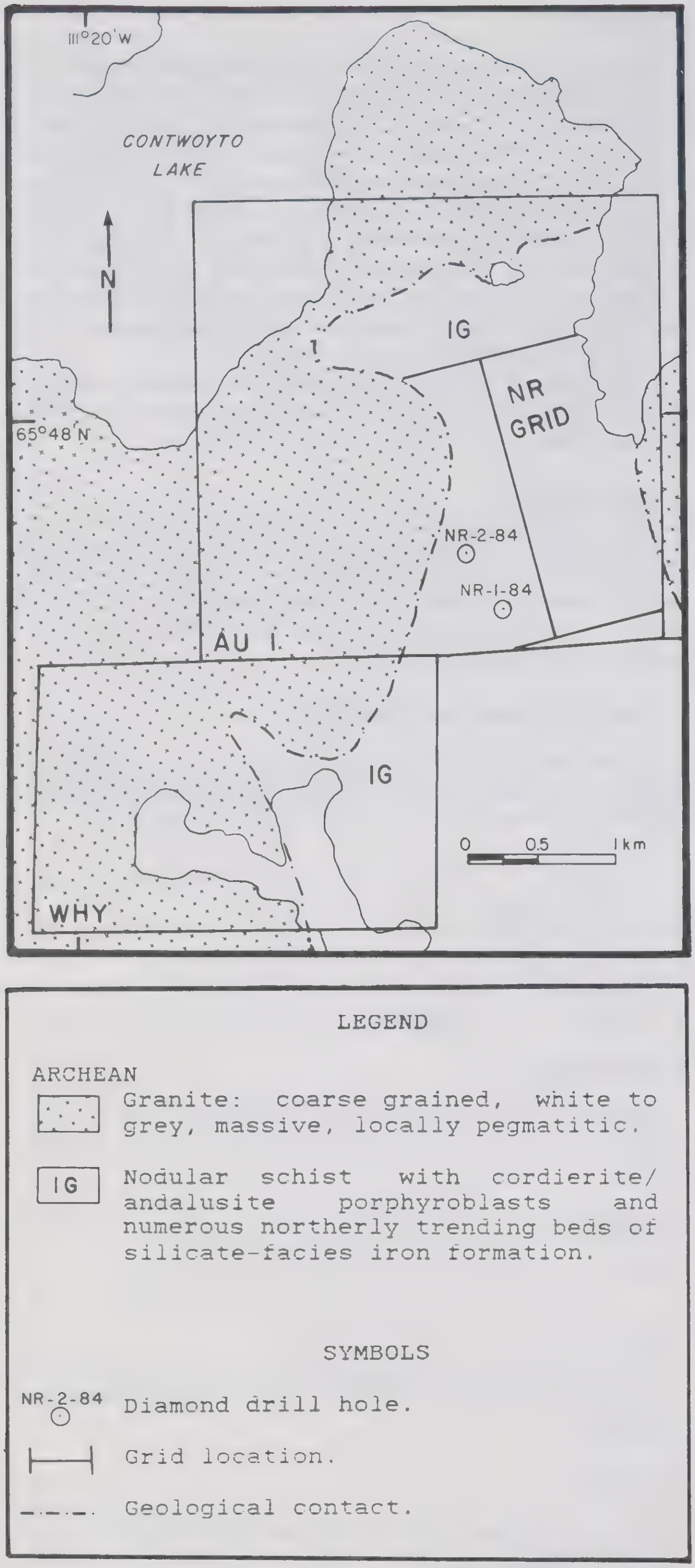


FIGURE 8-41: Geology of the WHY and AU 1 claims (geology modified from DIAND assessment report 081849).

done (DIAND assessment reports 017153, 017232). The MOP claims covering the area now held as AU 1 were allowed to lapse.

AU 1 was staked in 1981 for Hemisphere Development Corporation. Bow Valley Industries optioned the claim in late 1983.

DESCRIPTION

The geology is shown in Figures 8-28 and 8-41. The western part of the claim is underlain by muscovite-biotite granite. Nodular, cordierite- and andalusite-bearing biotite schists of the Yellowknife Supergroup, containing lenses of amphibolitic iron formation underlie the eastern part.

Tremblay (1976), Fraser (1964) and Bostock (1980) mapped the area at 1:50,000, 1:506,880 and 1:250,000 respectively.

CURRENT WORK AND RESULTS

The claims were geologically mapped and 39.7 line km of grid were established to cover the metasediments. Mapping at 1:2000, total field magnetic, vertical gradient and VLF surveys were done. All anomalies are believed to be caused by sulphide-bearing iron formation. Over 50 grab samples were analyzed for gold; the highest assay was 1.37 g/t Au.

Two holes totalling 162.8 m were drilled to test geophysical anomalies. Hole NR-2-84 intersected a zone of iron formation intruded by late-stage quartz. Samples from this zone assayed up to 1.99 g/t Au over 1.0 m.

GOLD CLAIM

Hidden Lake Gold Mines Ltd.	Gold
P.O. Box 2670	76 E/14
Yellowknife, NWT, X1A 2P9	65°49′N, 111°04′W

REFERENCES

Bostock (1980); Fraser (1964); Schiller and Hornbrook (1964); Tremblay (1976).

DIAND assessment reports: 017147, 082049.

PROPERTY

GOLD 1.

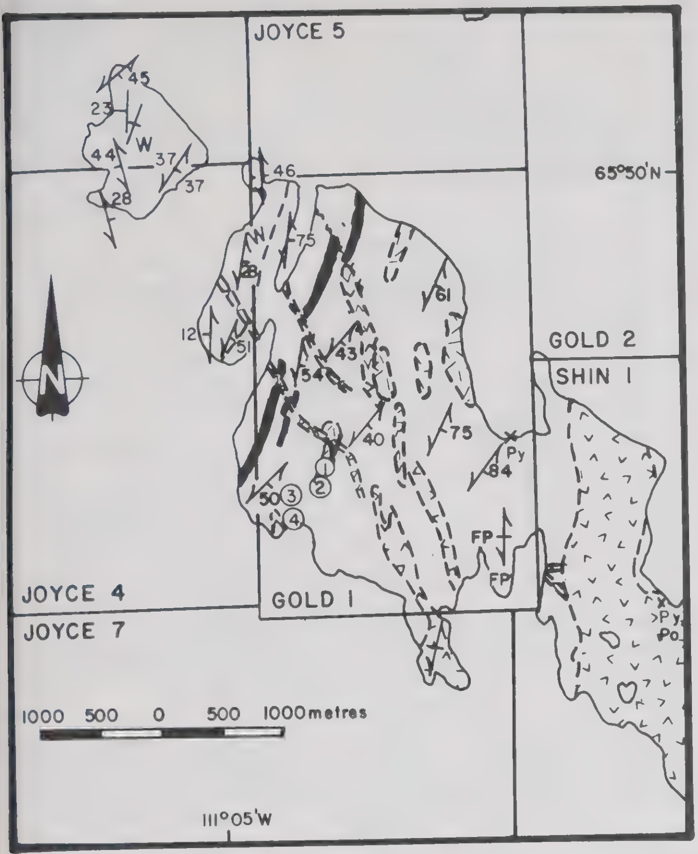
LOCATION

The claim is 410 m northeasterly from Yellowknife, on a peninsula on the northeastern shore of Contwoyto Lake (Fig. 8-28).

HISTORY

The ground was staked by Conwest Exploration Ltd. as the ROX 1-54 claims and optioned to Falconbridge Nickel Mines Ltd. In 1962, the claims were geologically mapped, trenched and sampled (DIAND assessment report 017147). In 1963, 194.2 m of diamond drilling was done (Schiller and Hornbrook, 1963).

GOLD 1 was staked and recorded by F. Diamond'C in 1983 and transferred to Hidden Lake Gold Mines in 1984.



LEGEND

PROTEROZOIC

Diabase dykes and sills.

APHEBIAN

GOULBURN GROUP

W Western River Formation: slate, dark grey to purplish grey, thinly bedded, with limy-argillaceous, pink to grey concretions; minor white quartzites near contact with Yellowknife Supergroup greywacke.

ARCHEAN

Gabbro, diorite, granodiorite and peridotite/pyroxenite dykes, locally with ilmenite and magnetite.

YELLOWKNIFE SUPERGROUP

Iron formation, rusty weathering, amphiboles ± garnets, arsenopyrite, pyrite, pyrrhotite, chalcopyrite.

Greywacke, siliceous greywacke and schists, slates and phyllites.

SYMBOLS

--- Geological boundary: approximate, assumed.

Bedding: inclined, vertical.

Foliation: inclined, vertical.

~~~ Fault.

X Py,Po Pyrite, pyrrhotite.

FP Feldspar porphyry.

(1) 1962 gold and silver assays, Falconbridge Nickel Mines Ltd, Rox claims, DIAND assessment report 017147.

FIGURE 8-42: Geology of the GOLD claim, showing sample locations 1 to 4. Assay results are:
1) 0.12 oz/T Au, 0.35 oz/T Ag;
2) 0.10 oz/T Au, 0.34 oz/T Ag;
3) 0.04 oz/T Au, 0.26 oz/T Ag;
4) 0.02 oz/T Au, 0.46 oz/T Ag.
(geology from DIAND assessment report 017147).

DESCRIPTION

Regional and claim geology are shown in Figures 8-28 and 8-42. The claim is underlain by Yellowknife Supergroup metasediments and iron formation and cut by numerous northwesterly trending diabase dykes. Proterozoic Peacock Hills concretionary argillites outcrop on the tip of the peninsula.

The area was mapped by Fraser (1964), Tremblay (1976) and Bostock (1980).

CURRENT WORK AND RESULTS

A 112 line km, helicopter-borne EM magnetic and VLF survey was flown over the claim. A few moderately high conductors were outlined. Several magnetic anomalies are interpreted to be either iron formation or diabase dykes.
~~~

RUSSELL LAKE — INDIN LAKE SUPRACRUSTAL BELT

The Indin Lake Supracrustal Belt is a sinuous belt of metavolcanics and metasediments, near the western margin of the Slave Province. Indin Lake is roughly 75 km north of the southern end of the belt.

An "isthmus" of metasediments joins the Indin Lake Supracrustal Belt with the Russell Lake Belt to the south.

BUGOW CLAIMS

Cominco Ltd.	Gold
2300 - 200 Granville St.	85 O/4
Vancouver, B.C., V6C 2R2	63°11′N, 115°50′W

REFERENCES

Lord (1942).
DIAND assessment report: 081839.

PROPERTY

BUGOW 1-20 (396 ha).

LOCATION

The property is 90 km northwest of Yellowknife and 45 km north of the village of Rae. Access is by float plane or by boat from Yellowknife via Frank Channel, Marion Lake and Russell Lake.

HISTORY

The property was staked by Mr. F. Thompson in 1939 and restaked by Mr. Andy Bugow in 1945. Andrew Yellowknife Mines Ltd. acquired the property in 1946 and did sufficient work to maintain the claims in good standing until 1984. Andrew Yellowknife amalgamated with other small companies in 1954 to form Pardee Amalgamated Mines Ltd. The claims were transferred to Rio Algom Ltd. in 1962, to Highwood Resources Ltd. in 1982, and to Cominco Ltd. in 1984. The property has since been brought to lease.

DESCRIPTION

The claims are underlain by Yellowknife Supergroup metasedimentary rocks (Lord, 1942). These include nodular schist, impure quartzite and minor amphibolitic, cherty iron formation. Nodular schist with porphyroblasts of andalusite and cordierite is the most common rock. Bedding planes and foliation both trend about 140° and dip almost vertically.

CURRENT WORK AND RESULTS

Work done in 1984 included linecutting (17.5 line km), geological mapping (1:2000), rock sampling and magnetic surveying.

Gold on the property is associated with iron formation, which comprises amphibole-rich siliceous beds that occasionally contain garnets and up to 25% sulphides. Pyrite, pyrrhotite and arsenopyrite are the main sulphides, and locally, they assume a laminated or bedded aspect. Several distinct iron formation units have been identified on the property; these probably are separate beds rather than fold repetitions.

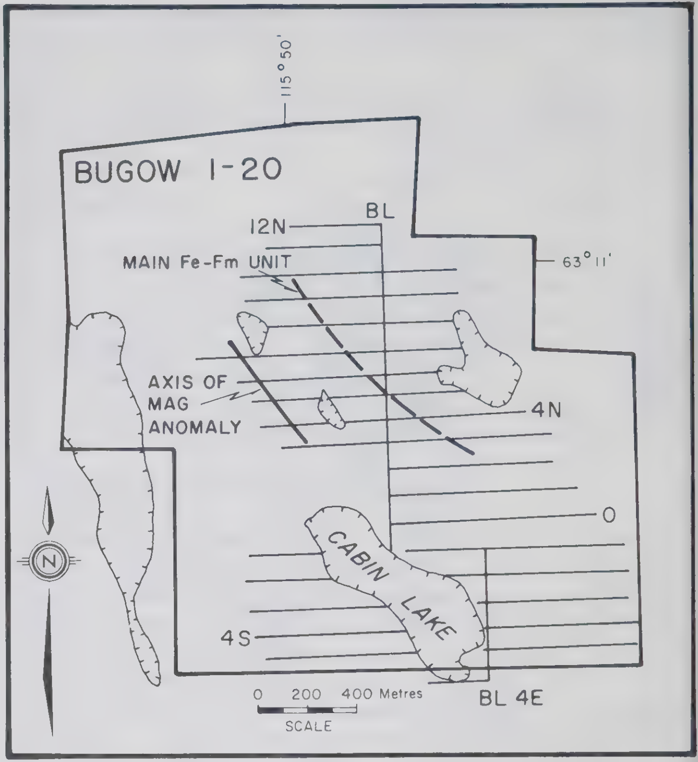


FIGURE 8-43: BUGOW claims showing grid, magnetic anomaly and main iron - formation unit. Turbidites underlie most of the property.

The thickest and most continuous iron formation unit (Fig. 8-43) is composed of a series of lenses, the longest of which has a strike length of 300 m and is up to 8 m wide. All samples collected from this unit assayed better than 1.0 ppm Au. The best assays were 9.6 ppm Au across 0.8 m and 7.43 ppm Au across 2.0 m. The widest chip sample assayed 1.78 ppm Au across 7.7 m.

The magnetic survey showed that there is little magnetic response over this iron formation unit. A strong magnetic anomaly ranging to 1000 gammas above background was detected about 100 m west of this main iron formation (Fig. 8-43), but the magnetic response over the remainder of the property is relatively flat.

Six holes were drilled in 1985. The Cominco option expired in 1986 and the property reverted to Highwood Resources Ltd.

NANCY CLAIMS

Comaplex Resources
International Ltd.
#901,1015-4 St. S.W.
Calgary, Alta., T2R 1J4

Gold
85 O/14
63°55'N, 115°17'W

REFERENCES

Lord (1942).
DIAND assessment reports: 019682, 081973.

PROPERTY

NANCY 1-2 (1359 ha).

LOCATION

The claims are about 170 km north-northwest of Yellowknife.

HISTORY

In 1971, Great Plains Development trenched and conducted ground geophysical surveys to evaluate an anomaly near Lil Lake (Fig. 8-44) detected by an airborne EM survey (DIAND assessment report 019682). The anomaly was caused by a 0.6 m wide quartz vein containing massive sulphides. Comaplex briefly prospected the area in 1984 and collected rock samples near Lil Lake that contained 100 to 400 ppb Au. The NANCY claims were staked on behalf of Comaplex Resources International Ltd. in May, 1985. Subsequently, 75% ownership was transferred to Petromet Resources Ltd. The claims are subject to a joint venture agreement held by Comaplex, Petromet and Echo Bay Mines Ltd.

DESCRIPTION

The claims are entirely underlain by mafic metavolcanics of the Yellowknife Supergroup (Lord, 1942).

CURRENT WORK AND RESULTS

A two-person crew spent six days on the property in July, 1985, to establish a small grid (Fig. 8-44) and to conduct soil and rock sampling and mapping (1:2500) surveys of the grid. NANCY 2 was also prospected. Fifty rock samples and 90 soil samples were collected and analyzed for gold and 29 other elements. No gold was detected in any of the samples. No further work was recommended.

RA CLAIMS

Comaplex Resources
International Ltd.
#901, 1015 - 4 St. S.W.
Calgary, Alta., T2R 1J4

Gold
85 0/14
63°57'N, 115°15'W

REFERENCES

Lord (1942).
DIAND assessment reports: 019682, 081971.

PROPERTY

RA 2-3 (397 ha).

LOCATION

The claims are on the west shore of East Wijinnedi Lake (Fig. 8-44), about 170 km north-northwest of Yellowknife.

HISTORY

The claims were held in 1946 by Vive Yellowknife Gold Mines Ltd., who reported low gold and copper assays. In 1971, Great Plains Development Company conducted an airborne EM survey in the Wijinnedi Lake area and detected a 6-channel anomaly at the contact between metasediments and metavolcanics on the present RA 3 claim.

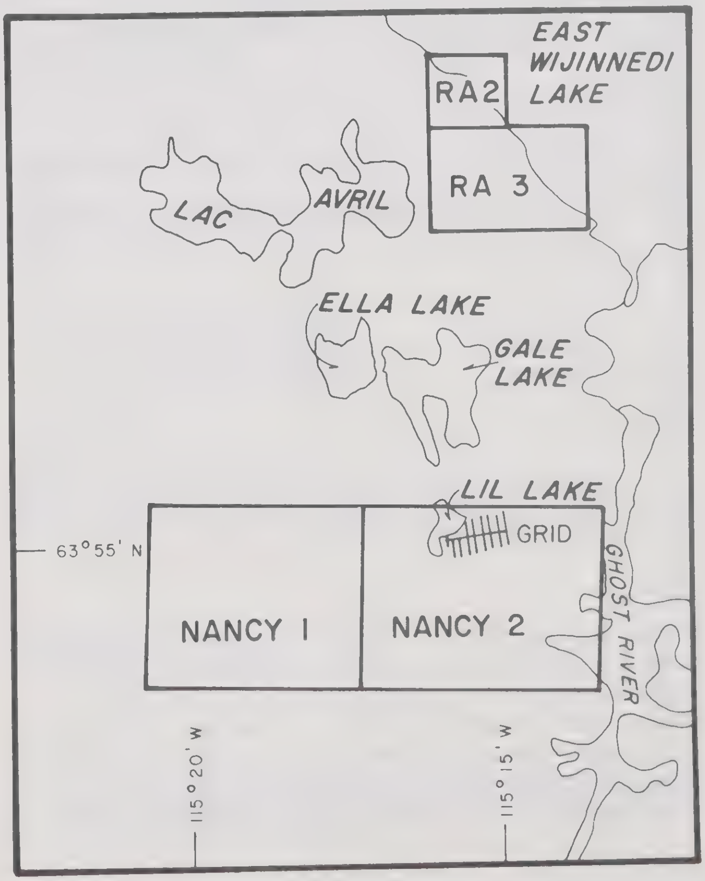


FIGURE 8-44: NANCY and RA claims.

The RA 2-3 claims were recorded by Comaplex Resources International Ltd. in August, 1984. Subsequently, 75% ownership was transferred to Petromet Resources Ltd. The claims are now subject to a joint venture agreement among Comaplex, Petromet and Echo Bay Mines Ltd.

DESCRIPTION

The RA claims are underlain mainly by mafic metavolcanics of the Yellowknife Supergroup (Lord, 1942). A narrow belt of metasediments crops out along the shore of East Wijinnedi Lake.

CURRENT WORK AND RESULTS

In 1985, a four-day program of mapping (1:10,000) and sampling was carried out. The EM anomaly was determined to be caused by a pod of graphitic argillite containing pyrite and minor chalcopyrite and arsenopyrite. Thirty-two grab samples of rock were collected and assayed for gold. Results were generally at or below the detection limit (0.03 ppm Au); the most anomalous sample assayed 0.10 ppm Au. It was recommended that no further work be done.

OTI CLAIMS

Comaplex Resources	Gold
International Ltd.	86 B/3
#901 - 1015 4th St. S.W.	64°09'N, 115°12'W
Calgary, Alta., T2R 1J4	

REFERENCES

Lord (1941, 1942, 1951); Seaton (1984); Tremblay and others (1953).

DIAND assessment reports: 081625, 081977 to 081979.

PROPERTY

OTI 1-5 (3386 ha)	64°13'N, 115°15'W
OTI 6-7 (753 ha)	64°09'N, 115°12'W
OTI 8 (1045 ha)	64°07'N, 115°15'W

LOCATION

The claims form three separate blocks (listed above and shown in Fig. 8-45) and are between Indin and Damoti Lakes about 210 km north of Yellowknife.

HISTORY

Work in the thirties and forties in the Indin Lake region is summarized by Lord (1941, 1951). A detailed account of exploration in the Indin Lake-Damoti Lake area is given by Seaton (1984, p. 399-400). The OTI 1-7 claims were recorded by Comaplex Resources International Limited in 1984. OTI 8 was added in May of 1985. A 50% interest in all the OTI claims was transferred to Petromet Resources Limited in 1985.

DESCRIPTION

The area of the claims was mapped by Lord (1942) at 1:254,440 and by Tremblay and others (1953) at 1:63,300. OTI 1-5 is centered on a northeasterly trending, 3 km wide Archean greenstone belt flanked by narrower belts of felsic volcanic rocks which are in turn flanked by metasediments. All units are steeply dipping. OTI 6-7 are to the southeast of OTI 1-5 and are mainly underlain by greenstone. OTI-8 is centered on a north-trending belt of metasediments (greywacke, argillite and metamorphic equivalents) that has been intruded by a small granodiorite pluton.

CURRENT WORK AND RESULTS

OTI 1-5: A 128 person-day exploration program was conducted to evaluate previously discovered gold showings and to identify new areas of interest. The following work was done: 1) reconnaissance mapping, prospecting and rock sampling (243 samples); 2) construction of two major and three minor cut-line grids (117 line km, see Fig. 8-45); 3) B- and C-horizon soil geochemical sampling on the grids (1541 samples); and 4) combined ground magnetometer and VLF-EM geophysical surveying on the grids.

The reconnaissance work resulted in the rediscovery of several previously worked showings, most of which consisted of quartz veins or quartz-carbonate alteration zones in basalt. Samples from these showings were either barren or weakly mineralized with precious metals (less than 0.05 ppm Au). An exception is one sample from a narrow zone of pyritic sediment on the OTI grid (4250 S, 40 W), which assayed 20.9 ppm Au. Several new showings were found, the most significant being a series of quartz veins and silicified shears cutting granitic intrusions in the vicinity of Andy Lake (Fig. 8-45). However, the vein systems do not appear to be extensive and assays (maximum 2.4 ppm Au) were discouraging. Minor base metals were identified in iron-oxide-stained graphitic argillite within a felsic tuff package at the north end of the OTI grid.

A total of 1472 B- and C- horizon soil samples were collected over the Oti and Indin grids at 40-m intervals on lines spaced 100 m apart. Another 117 samples were collected on the Betam and Lake Lake grids. Soils were analyzed for gold, silver, molybdenum, copper, zinc, lead, arsenic, manganese, iron and antimony. Only ten samples, all on the Oti Grid, contained a detectable amount of gold (range 0.03-0.21 ppm). No clusters of gold anomalies are apparent. In general, the other elements also yielded isolated anomalies or variations related to a change in bedrock.

The geophysical surveys outlined a number of conductors and magnetic anomalies, but only one (a conductor on the Lake Lake grid) corresponded with a gold showing.

OTI 6-7: A 19 person-day exploration program on OTI 6-7 involved the following work: 1) construction of a 9.6 line km grid (Fig. 8-45) along the axis of a shear zone identified as a target for structurally controlled gold mineralization; 2) prospecting and rock sampling (42 samples); 3) soil sampling on the grid (284 samples); and 4) a VLF-EM and magnetometer survey on the grid. No gold showings were found. Two samples of carbonatized metabasalt yielded 0.33% and 0.64% Cu. Soil samples were analyzed for gold and nine other elements. Only three soil samples contained traces of gold (0.05-0.20 ppm), but these were isolated spot anomalies. One coincident VLF-EM/magnetometer anomaly was obtained over cupriferous metabasalt. Another conductor lies to the west of a gully that marks a shear. The magnetic profile across the volcanic package is generally flat.

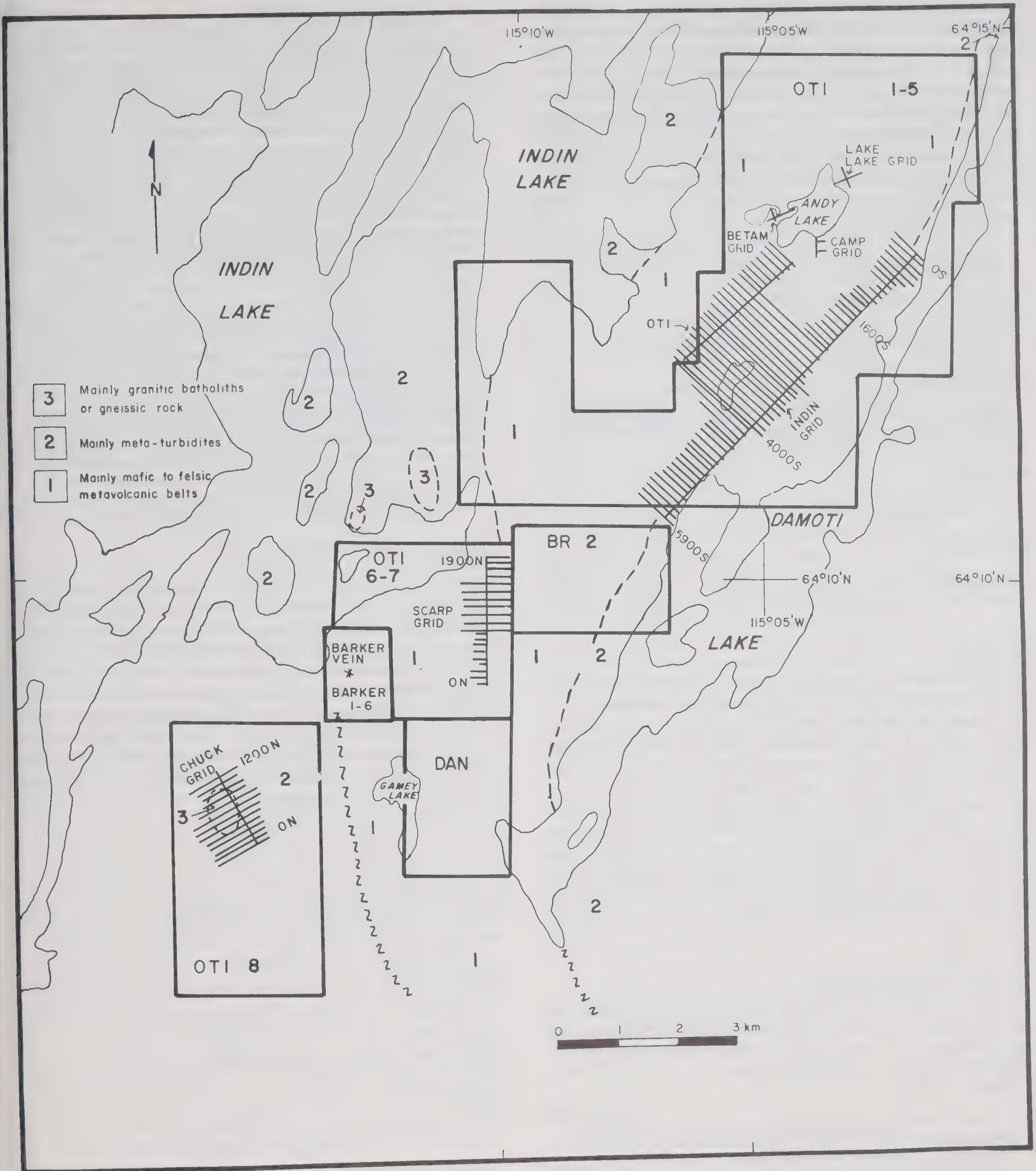


FIGURE 8-45: Properties, showings and grids in the south Indin Lake area (geology from Tremblay and others, 1953).

OTI 8: Work done was similar to that conducted on the other OTI claims. A grid (Fig. 8-45) totalling 13 line-km was established to cover a small plug of granodiorite intruded into Yellowknife Supergroup metasediments. The ground was prospected and eight rocks were sampled. The best assay was 0.02 ppm from a quartz vein cutting the granodiorite stock. Only two weak gold anomalies (0.03 and 0.19 ppm) were obtained from the 248 soil samples collected. These are near the granodiorite plug and are associated with a zone of arsenic-in-soil anomalies.

BARKER CLAIMS

Frontier Gold Mines Inc.	Gold
1029 Bel-Aire Drive S.W.	86 B/3
Calgary, Alta., T2V 2C1	64°09'N, 115°13'W

REFERENCES

Lord (1941, 1942, 1951); Tremblay and others (1953).
DIAND assessment report: 081785.

PROPERTY

BARKER 1-6 (Fig. 8-45).

LOCATION

The claims lie between Damoti and Indin lakes, about 210 km north of Yellowknife.

HISTORY

The area was initially staked as the ANN and ANNA claims in 1938 to cover a gold-bearing quartz-carbonate vein called the Barker Vein. About 2.6 kg of gold was recovered from 0.72 t of ore by Territories Exploration Ltd. in 1938. The claims were restaked by the Schwerdt brothers in 1940, and an additional 7.7 kg of gold was recovered. The claims were acquired by American Yellowkife Gold Mines in 1945 and returned to the Schwerdt brothers in 1946 after a 1400 m drilling program failed to outline ore. The claims lapsed, were restaked as VIDIE 1-6 by Dave Nickerson in 1976 and were transferred to Gary Swanson in 1982 and to Frontier Gold Mines Incorporated in 1984. In 1985 the name of the claims was changed from VIDIE to BARKER.

DESCRIPTION

The property was mapped by Lord (1942) at 1:254,440 and by Tremblay and others (1953) at 1:63,360. The claims are underlain mainly by Archean metabasalt and meta-andesite. A detailed description of the Barker Vein by Lord (1941, p. 64-65) is reproduced below:

> The rock near the vein is mostly massive, dark green, andesitic lava (greenstone) of the Yellowknife group; much of it is uniformly fine-grained, but some of it contains a few white phenocrysts or amygdules that range up to 1/2 inch across. The strike and dip of the lavas are not known. Feldspar- quartz porphyry cuts the lava and outcrops 50 feet east of the vein and in several places about 225 feet northeast of the vein. A granite body about 1/2 mile in diameter outcrops 2 miles southwest of the vein and another body about 2-1/2 miles in diameter outcrops 5-1/2 miles southeast of the vein. A major fault cuts the lavas about 1/4 mile west of the vein and strikes north 10 degrees west.
>
> The Barker vein is about 1/4 mile east of Indin Lake. The vein is 40 feet long at the surface, strikes north 25 degrees west, and dips 60 degrees (northeast). It is about 1 foot wide near the south end and gradually widens towards the north, the northern half of the vein ranging from 3 to 6 feet in width and ending abruptly in soft, grey, flaky schist. In places the rock next to the walls of the vein is strongly sheared for about 1 foot. The outcrop of the vein ended to the south against a fissure that strikes north 35 degrees west and dips 70° southwest. The fissure contains a few inches of sheared rock and gouge and may be a fault. The vein and fissure meet along a line that plunges about 35 degrees southeasterly and a pipe-like body of ore with abundant coarse gold occurred along this intersection. The pipe-like body was about 1 foot in diameter and was followed down the intersection of the vein and fissure for about 10 feet and ended at the interesection of the fissure and a vertical fracture that strikes north 75 degrees west. All ore shipped from the vein came from this body. The vein is not known to have been located south of the fissure or south of the vertical fracture. The vein material is a mixture of grey and white quartz, black and white, coarse-grained carbonate, fine-grained, white carbonate, and irregular fragments of chloritic wall-rock. Carbonate and quartz are present in about equal proportions, and the carbonate is probably calcite. Metallic minerals may constitute 2 per cent of the vein material; chalcopyrite is most plentiful and there is some galena, sphalerite, pyrite, arsenopyrite, and gold. A little cobalt bloom is reported to have occurred at the surface. Practically all known gold occurred in the pipe-like ore shoot at the south end of the vein, and the gangue in this shoot was mostly carbonate. Most of the gold is reported to have occurred in fine-grained carbonate.

CURRENT WORK AND RESULTS

In 1984, previously excavated trenches on the BARKER claims were sampled and mapped at 1:5000 and 1:500. Thirteen grab samples of vein material were collected from trenches, outcrops and core found in the vicinity of the Barker Vein. Assay results ranged from trace to 5 ppm Au. Geological observations suggest the presence of a northeast-striking, southeast-dipping fault with gold anomalies in an associated pyritiferous quartz-carbonate vein. Previous drilling, oriented to intersect gold-bearing zones associated with a northwest-trending fault, would have missed possible zones of interest in the northeast-striking fault.

BR 2 CLAIM

Mr. W.H. Brink	Gold
#1509, 20 Redgrave Drive	86 B/3
Weston, Ontario, N9R 3T8	64°10'N, 115°08'W

REFERENCES

Lord (1941, 1942, 1951); Tremblay and others (1953); Seaton (1984).
DIAND assessment report: 081954.

PROPERTY

BR 2 (627 ha, Fig. 8-45).

LOCATION

The claim is between Damoti and Indin lakes, about 200 km north of Yellowknife.

HISTORY

The area was staked as the DOINS claims by P.A. Schwerdt in 1939. These claims were acquired by Snowden Yellowknife Mines Ltd. in 1946. Five gold-bearing zones were discovered and evaluated by stripping, trenching and about 600 m of diamond drilling. The area was restaked as KIM 1 in 1981 by Comaplex Resources International Ltd. (Seaton, 1984, p. 401-404). Old trenches were mapped and sampled, but results were not encouraging and the claim was allowed to lapse. It was restaked as BR 2 for W.H. Brink in 1983, transferred to Noranda Exploration Company Limited in May, 1985, and subsequently returned to Mr. Brink.

DESCRIPTION

The claim is included in an area mapped by Lord (1942) at 1:254,440 and by Tremblay and others (1947) at 1:63,360. It is underlain mainly by steeply dipping metabasalt and meta-andesite of the Archean Yellowknife Supergroup. On the eastern third of the property, the mafic rocks are flanked by a narrow (maximum 300 m thick) north-northeasterly trending belt of felsic volcanic rocks, which are flanked to the east by metasediments.

The following gold-bearing zones were discovered on the property by earlier workers (Lord, 1941):

1) Hilltop showing (64º10′N, 115º08.9′W): This is a sinuously striking (northeast to northwest) carbonatized shear containing pyrite and chalcopyrite. It has been traced for 76 m and opened by four trenches.
2) Chuck vein (64º9.8′N, 115º08.4′W): This is a northeasterly striking, 2.4 m wide, vertically dipping, milky white quartz vein cutting mafic volcanic rocks. The vein carries pyrite, chalcopyrite, and reportedly, some free gold.
3) G zone or Splash vein (64º09.9′N, 115º08.1′W): This is a northeast-trending, 9 m thick zone of irregular quartz veins containing pyrite, chalcopyrite and free gold. (Most of the drilling done in 1946-47 was concentrated here according to information on Northern Mineral Inventory sheets. However, in DIAND assessment report 081954 it is reported that most drilling was done on the Pond vein.)
4) Pond vein (76 m west of Splash vein): This is a northeast-striking zone of lenticular quartz veins cutting mafic volcanic rocks and containing pyrite, chalcopyrite and reportedly a little free gold.
5) Wally vein (on the west shore of the pond opposite Pond vein): This vein is similar to the Pond vein.

CURRENT WORK AND RESULTS

In 1985, the claim was prospected and mapped at 1:10,000. Shear zones were mapped in detail and pre-existing trenches and pits in the shear zones were sampled. A total of 92 chip samples and 30 grab samples were analyzed for gold. Lithogeochemical analyses were done on 42 additional samples. Samples from several shear zones yielded anomalies of greater than 100 ppb Au. These shears were resampled (25 samples) and an additional 21 rocks were collected for lithogeochemical analysis. Magnetometer and VLF-EM surveys were conducted on a flagged grid in November and December.

Geological mapping confirmed that most of the claim is underlain by andesite. Several narrow (maximum 72 m) north-northeasterly trending beds of mafic fragmental tuff were identified. A relatively thick (maximum 150 m) bed of rhyolite was mapped south of the lake at the northwest corner of the claim, but the thick (300 m) felsic volcanic unit indicated by Tremblay and others (1953) across the eastern third of the property was not substantiated. Instead, there are several continuous to discontinuous felsic volcanic beds that are generally less than 50 m thick and probably aggregate not more than 100 m. The volcanic units trend 032º and dip steeply to the east. Top indicators in the volcanics, as well as in the turbidites that underlie the eastern third of the claim, indicate that the sediments overlie the volcanics.

Detailed mapping and sampling were done on the Pond and Chuck veins and Hilltop showing. On the Pond vein, lithogeochemical studies indicate limited sodium depletion and some enrichment in magnesium, potassium and calcium in sheared mafic volcanics. Of 78 chip samples taken from a grid, 11 yielded assays ranging from 100 to 2100 ppb Au. One grab sample of quartz containing chalcopyrite and pyrite assayed 91.2 ppm Au. On the Chuck vein, lithogeochemical studies indicate some sodium depletion and magnesium enrichment in sheared mafic volcanics. One anomalous chip sample (0.5 m of 870 ppb Au) and grab sample (540 ppb Au) were obtained from nine samples collected. No gold anomalies were obtained from 16 chip samples collected from the Hilltop showing.

Only one anomaly (280 ppb Au) was obtained from 18 rock samples collected during reconnaissance.

Magnetometer and VLF-EM surveys (15.4 line km) did not detect features deemed relevant to gold-bearing structures, and further work on the property was not recommended. In 1986, the claim was transferred back to Mr. Brink, who recommends that a winter VLF-EM survey be conducted on parts of the property covered by lakes (personal communication).

DAN CLAIM

John I. Raines	Gold
Box 6596, Station D	86 B/3
Calgary, Alta.	64º10′N, 115º10′W

REFERENCES

Lord (1941, 1942); Tremblay and others (1953).
DIAND assessment reports: 081933, 081934, 081935.

PROPERTY

DAN 1 (502 ha).

LOCATION

The claim is west of Damoti Lake, 210 km north of Yellowknife.

HISTORY

The claim was staked in 1983. Signs of earlier exploration were reported, but there is no record of this activity in assessment files. The property is south of the BARKER claims

(originally the ANNA group), from which 10 kg of gold were recovered from the Barker Vein between 1938 and 1941 (Lord, 1942, see Fig. 8-45).

DESCRIPTION

The area was mapped by Lord (1941) at 1:253,440 and by Tremblay (1953) at 1:63,360. The claim is mainly underlain by hornblende schist, hornblende-feldspar gneiss and amphibolite derived from basalt and andesite of the Archean Yellowknife Supergroup. Several northerly trending, steeply dipping felsic volcanic beds were mapped by Tremblay (1953) in the north-central part of the claim, and the volcanics are cut by several north-trending diabase dykes. Lord's (1941) map has a gold showing in the mafic metavolcanics east of Gamey Lake in the west-central part of the property, but additional information on this showing was not found.

CURRENT WORK AND RESULTS

In 1983, an airphoto interpretation study of the property was done (DIAND assessment report 081933). In 1984, a 1:5000-scale topographic map of the claim was prepared by McElhanney Surveying and Engineering Ltd. of Vancouver (DIAND assessment report 081934). Using this map as a base, reconnaissance geological mapping and magnetometer surveys were conducted in 1985 (DIAND assessment report 081935).

The magnetometer survey was conducted on 9 east-west lines (total 10.5 line km) established by hip chain and compass. Readings were taken at 60 m intervals along lines. Two strong north-trending magnetic anomalies coinciding with diabase dykes were outlined. Twelve grab samples of quartz veins, shear zones, rusty diabase and sulphide-rich volcanics were assayed for gold. A sample of rusty diabase assayed 0.03 ppm Au, but only traces of gold were detected in the other samples.

YUM CLAIMS

Highwood Resources Ltd.	Gold
#400 - 805 8th Ave. S.W.	86 B/6
Calgary, Alta., T2P 1H7	64°15′N, 115°23′W

REFERENCES

Stanton and others (1954).
DIAND assessment report: 082044.

PROPERTY

YUM 1-2 (1568 ha).

LOCATION

The claims are in the Indin Lake area, about 210 km north of Yellowkife.

HISTORY

No record of previous exploration on the claims is known. The property adjoins Echo Bay Mines Limited's KIM group (Fig. 8-46), where considerable drilling during the past several years has outlined a significant gold deposit hosted in veined pyrrhotite-arsenopyrite-rich, carbonatized mafic flows of the Yellowknife Supergroup. The YUM claims were staked in October, 1984.

DESCRIPTION

The claims are underlain mainly by an east-northeasterly trending belt of mafic Yellowknife Supergroup metavolcanics (Stanton and others, 1954). This belt is flanked to the north and south by nodular schists and other highly metamorphosed sedimentary rocks.

CURRENT WORK AND RESULTS

In 1985, a geologist and a prospector completed a 15-day program of reconnaissance sampling and geological mapping on the property. Eight rock samples were collected and assayed to check the gold content of sulphidic and quartz-rich zones identified on the property. Results indicated either trace or nil gold.

FUR CLAIMS

Aber Resources Ltd.	Gold
#400, 805 - 8th Ave. S.W.	86 B/6
Calgary, Alta., T2P 1H7	64°18′N, 115°09′W

REFERENCES

Lord (1951); Stanton and others (1954).
DIAND assessment report: 082041.

PROPERTY

FUR 1-2 claims (1190 ha).

LOCATION

The claims are north of Float Lake in the Indin Lake area, about 210 km north of Yellowknife (Fig. 8-46).

HISTORY

The area north of Float Lake was staked as the ROLEX group by Bidd Consolidated Mines Limited in the late forties. About 39 trenches were blasted into a large (24 by 23 m) circular mass of white, glassy quartz intruding Yellowknife Supergroup greywackes and argillites about 180 m northeast of the north end of Float Lake. Some drilling was done and trenches were excavated at other locales on the property. Apparently, only low gold assays were obtained (Lord, 1951). The area was restaked as the FUR claims in October, 1984.

DESCRIPTION

The claims are entirely underlain by a northerly trending, tightly folded succession of interbedded Yellowknife Supergroup greywackes and argillites. (Stanton and others, 1954). The Archean metasediments are cut by Proterozoic diabase dykes.

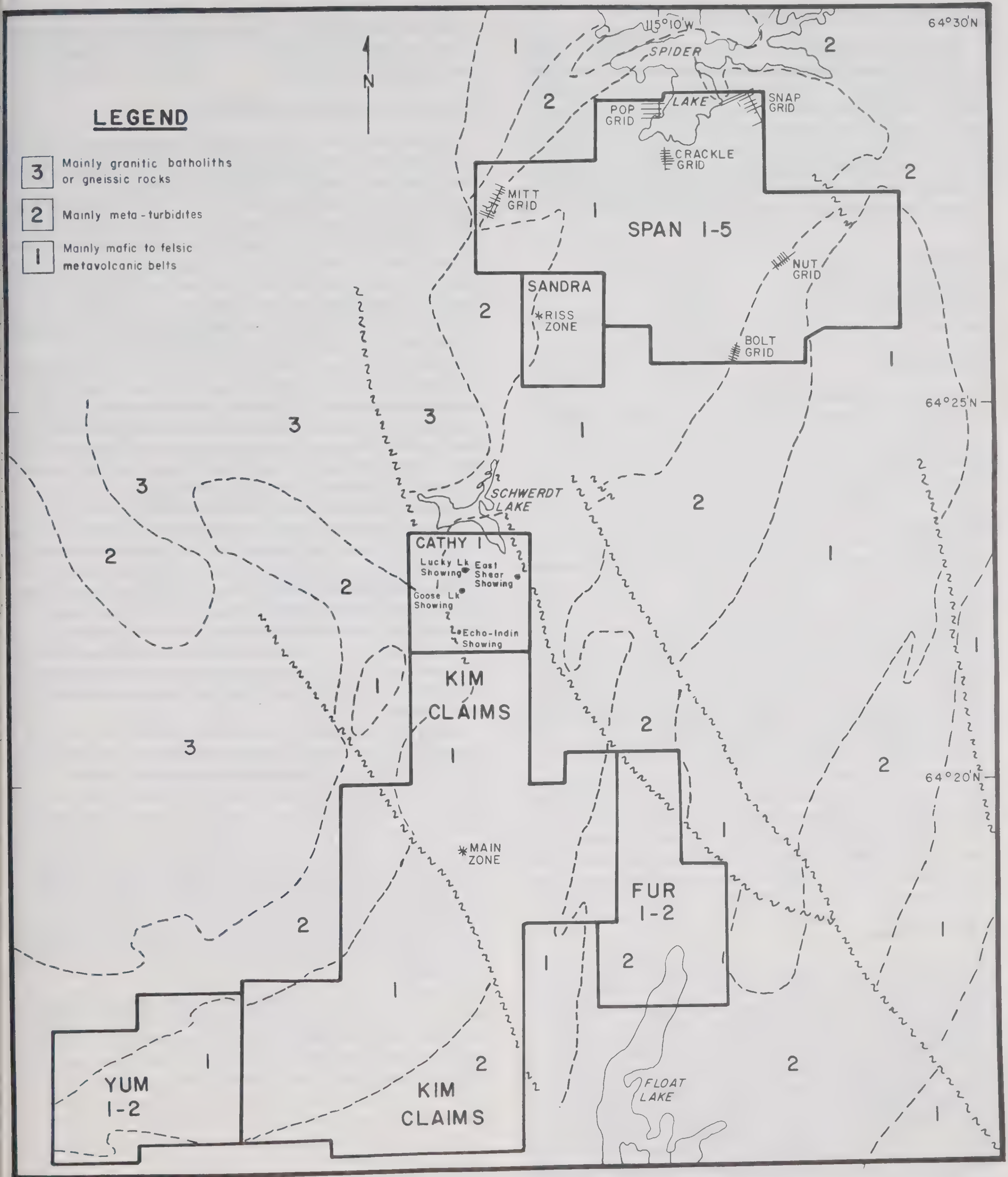


FIGURE 8-46: Properties, showings and grids in the north Indin Lake area (geology from Stanton and others, 1954).

CURRENT WORK AND RESULTS

In 1985, a geologist and a prospector completed a 15-day program of reconnaissance sampling and geological mapping on the property. A total of 24 samples, mainly from quartz bodies and diabase dykes, were collected and assayed for gold. Results were trace to nil gold in all but one of the samples. An assay of 3.4 ppm Au across 3 m was obtained in an old trench, where the mineralization was described as "pyrite-pyrrhotite-chalcopyrite" associated with quartz in diabase dike' (DIAND assessment report 082041).

CATHY 1 CLAIM

Frontier Gold Mines Inc.	Gold
1029 Bel-Air Drive S.W.	86 B/6
Calgary, Alta., T2V 2C1	64°22′N, 115°15′W

REFERENCES

Stanton and others (1954).
DIAND assessment reports: 071253, 081784, 081893.

PROPERTY

CATHY 1 (752 ha).

LOCATION

The claim is about 217 km north-northwest of Yellowknife.

HISTORY

CATHY 1 covers ground held as ECHO X 1-18 by C. Schwerdt and Conjo Yellowknife Mines Ltd. and as ECHO 1-20 by C. Schwerdt and Echo-Indin Mine Ltd. in the forties. In 1945, exploration was carried out by Trans-American Mining Corporation Ltd. Channel samples were obtained over various widths with the best assay being 31.5 ppm Au. They reportedly completed 2290 m of diamond drilling which outlined two ore shoots. Showings near Lucky Lake were staked by Falconbridge Nickel Mines Ltd. as FAG 1-17 in 1964 and probed by 334 m of diamond drilling in 1965 (DIAND assessment report 017253). No encouraging assays were reported from core. CATHY 1 was recorded for Gary Swanson in 1983 and transferred to Frontier Gold Mines Incorporated in December, 1984.

DESCRIPTION

The claim is included in an area mapped at 1:63,360 by Stanton and others (1954). The central part of the claim is underlain by Archean hornblende schist, quartz-hornblende-feldspar gneiss and amphibolite derived from basalt and andesite. In the western part of the claim, these metavolcanic rocks are truncated by the north-northwesterly trending Lex Fault. Displacement of units suggests that there has been 2.8 km of sinistral strike-slip movement along this fault. To the west of Lex Fault are outcrops of granodiorite and amphibolite-grade metasediments. Amphibolite-grade metasediments also crop out to the east of the fault in the northwestern part of the property, whereas a belt of metasediments in the northeastern part of the claim is metamorphosed to greenschist facies. Northerly trending felsic volcanic units predominate in the southeast part of the property and along its easternmost margin. A short segment of the Wye Fault, which parallels the Lex Fault, cuts across the extreme northeast corner of the claim.

CURRENT WORK AND RESULTS

In 1984, the claim was traversed to locate gold showings that were trenched in the 1940's. The following showings were located, mapped (1:5000), and sampled:

East Shear showing (64°22.6′N, 115°14.3′W): Three trenches cut sheared, calcareous and sometimes graphitic and talcose greywacke. The shear strikes northerly and dips vertically. Twenty-one grab and chip samples were collected from the three trenches. Sixteen assays yielded only trace gold. The best chip sample assayed 0.14 ppm Au across 0.6 m. The best grab sample assayed 1.7 ppm Au. The East Shear showing was not considered significant.

Lucky Lake showing (64°22.7′N, 115°16′W): A 7.5-m trench cuts sheared mafic metavolcanics. The shear, which trends northerly and dips 70°E, is occupied by a lenticular body of quartz and carbonate veins and veinlets carrying abundant arsenopyrite. Six grab samples of grey vein quartz containing calcite, arsenopyrite and pyrite assayed from trace to 61 ppm Au (mode approximately 8.6 ppm).

Goose Lake showing (64°22.5′N, 115°16′W): This is a shear similar to the Lucky Lake showing. Three trenches expose quartz-calcite veinlets from 5.0 cm to 1.0 m thick. Two select grab samples assayed 5.5 and 12.5 ppm Au.

Echo-Indin showing (64°21.9′N, 115°16.2′W): This showing was visited and sampled that year by Echo Bay Mines Ltd. It is described as quartz-carbonate material containing pyrite and arsenopyrite and cutting volcanics or tuffs of intermediate composition. Echo Bay reported assays of 7.95 ppm Au across 1 m and 4.66 ppm Au across 1.5 m on a continuous chip sample.

E.O. Chisholm, P. Eng., and R. Day visited the CATHY 1 claim in 1985, and also visited the KIM claim. Chisholm states that "The Echo Indin gold occurences on the CATHY 1 claim appear to be a faulted off extension of the new KIM ore body". He suggests the total length of the gold bearing shear zone on the CATHY 1 claim between Lucky Lake and the Echo Indin showings to the south could be in the order of 1220 m if continuous, and has recommended a detailed 3 phase exploration programme for the CATHY 1 claim.

Other showings: Iron-stained felsenmeer and vein quartz in sheared greywacke were sampled near the southeast arm of Schwerdt Lake. Best assay was 0.21 ppm Au in the rusty felsenmeer.

In 1985, several of the showings were resampled and a future program of grid-based geophysical and geochemical surveying was recommended. Chip sampling of the Echo-Indin showing yielded best assays of 7.95 ppm Au across 1.0 m and 4.66 ppm Au across 1.5 m.

SANDRA CLAIM

Frontier Gold Mines Ltd. — Gold
1029 Bel-Air Drive S.W. — 86 B/6
Calgary, Alta., T2V 2C1 — 64°26'N, 115°12'W

REFERENCES

Stanton and others (1954).
DIAND assessment report: 081886.

PROPERTY

SANDRA claim (502 ha).

LOCATION

The claim is east of Riss Lake, about 225 km north-northwest of Yellowknife.

HISTORY

Ingray Yellowknife Mines Limited was incorporated in early 1945 when it acquired the 42-claim RIS group at the east side of Riss Lake. Exploration work in 1945-46, under the direction of Trans-American Mining Corporation Limited reportedly uncovered several gold-bearing zones on which 762 m of drilling was completed. Three main gold showings, said to be in shear zones, were identified. The "Swamp" zone, containing arsenopyrite, pyrrhotite and chalcopyrite, was traced along strike for 450 m and throughout this distance gold panning samples were collected. The Main zone, 183 m north of and parallel to the Swamp zone, gave some evidence of gold and was trenched over a strike length of 152 m. The third zone, located 152 m northeast of the Main zone, reportedly yielded some excellent pannings. These zones are marked collectively as the Riss showing in Fig. 8-46. In 1976, the ground was restaked as RISS 1-12 and FN 1-12 and some trenching was done (DIAND assessment report 081886). SANDRA was recorded for W. Brink in April of 1983, transferred to Gary Swanson in June of 1985, and transferred to Frontier Gold Mines Ltd. the following August.

DESCRIPTION

The claims are included in 1:63,360 geological mapping by Stanton and others (1954). The eastern two thirds of the property is underlain mainly by mafic metavolcanics. These are fringed to the west by a thick (maximum 600 m) unit of felsic metavolcanics. The westernmost perimeter of the property is underlain by metasediments, which overlie the volcanics.

CURRENT WORK AND RESULTS

In 1985, one day was spent examining and sampling the Riss showing. It consists of quartz and carbonate veins and veinlets in sheared calcareous andesite. The shear has been traced by trenches for a strike distance of about 90 m and across a width of about 7 m. Four grab samples assayed trace to 0.68 ppm Au. Of six soil samples collected across the shear zone, three yielded nil gold and three yielded 5 ppb Au. Evaluation was incomplete due to time and weather limitations.

SPAN 1-5 CLAIMS

Comaplex Resources International Ltd. — Gold
#901 - 1015 4th St. S.W. — 86 B/6
Calgary, Alta. T2R 1J4 — 64°28'N, 115°10'W

REFERENCES

Lord (1941, 1951); Stanton and others (1954).
DIAND assessment reports: 017382, 017734, 060413, 062065, 062141, 081980.

PROPERTY

SPAN 1-5 (4370 ha).

LOCATION

The claims are south of Spider Lake, aboout 230 km north-northwest of Yellowknife.

HISTORY

The claims are in an area that has been prospected for gold since the late thirties. Most activity has been focused in the Spider Lake area immediately north of the SPAN property. Claims were held by Spinet Gold Mines Ltd. (FLY claims, 1945), Springer Sturgeon Gold Mines Ltd. (LUX, TEX, MEX, HC claims, 1945), Giant Yellowknife Mines Ltd. (JERRY claims, 1967), J.D. Mason (DAN claims, 1970) and, most recently, Treasure Island Resources Ltd. (DAN, EAEC, BOOTY, LOOT and YAK claims, 1983 to present). Further information on this earlier work can be found in Lord (1941, 1951) and in the various DIAND assessment reports listed under REFERENCES.

The SPAN claims were recorded in December, 1984 and are held jointly by Comaplex Resources International Limited and Petromet Resources Limited. The claims are currently (1985) under option to Placer Development Limited.

DESCRIPTION

The claims are included in an area mapped at 1:63,360 by Stanton and others (1954). The property is underlain by a thick unit of mafic to intermediate metavolcanics which are locally overlain by felsic pyroclastics. The metavolcanic package is juxtaposed against high and low grade turbiditic metasediment. The assemblage is intruded by a minor amount of Archean gabbro and quartz-albite dyke rock and is cut by a suite of diabase dykes.

The structure of the area is exceedingly complex and poorly understood. The stratigraphic package appears to have been folded and faulted about several divergent axes. The result is a complicated rock distribution pattern which is best shown by the trace of the contact between the volcanic units and the stratigraphically overlying turbiditic metasediments.

Previously described gold showings in the Spider Lake area appear to be in close proximity to contacts between metavolcanic and metasedimentary units.

CURRENT WORK AND RESULTS

The purpose of the 1985 work was to relocate and evaluate previously discovered gold showings on the property and to

identify new areas of interest. The program included: reconnaissance mapping, prospecting and rock sampling (283 samples); construction of six small grids (Fig. 8-46) over specific exploration targets (13.91 line-km); a B-C horizon soil geochemical survey on the grids (461 samples); and a combined VLF-EM and magnetometer survey on each grid.

The only significant results obtained were on the POP grid west of Spider Lake in the northwest part of the property (Fig. 8-46), where a series of old trenches expose silicified and mineralized shear zones cutting metasediments and metabasalts. Four distinct clusters of anomalous soils (up to 0.15 ppm Au) most with coincident arsenic anomalies were delineated by soil sampling (126 samples) survey on the POP grid. Nineteen trench samples from the POP grid yielded from 0.01 to 8.0 ppm Au (average 0.89 ppm). Best results were from a lenticular quartz-bearing shear zone (C-Zone) striking 120º, dipping steeply south and cutting metabasalt. The C-Zone extends 100 m and is from 0.6 to 7.0 m wide. Whole rock and minor-element analyses of 48 samples from the POP grid indicate that mineralization is associated with increases in SiO_2 and K_2O in the country rocks and depletions in Al_2O_3, MgO, Na_2O and Fe_2O_3.

In addition to gold and arsenic, rock and soil samples were also analyzed for molybdenum, copper, zinc, lead and antimony. Although isolated spot anomalies were found, including samples anomalous in more than one element, no clear-cut targets were identified as a result of this work. The geophysical surveys did not identify anomalies deemed related to gold mineralization.

SPIDER LAKE PROJECT

Suncor Inc.	Gold
Box 38, 500-4 Ave. S.W.	86 B/6,11
Calgary, Alta., T2P 2V5	64º30'N, 115º07'W

REFERENCES

Lord (1942, 1951); Padgham and others (1978); Seaton and Crux (1985); Stanton and others (1954).

DIAND assessment reports: 017382, 017734, 019699, 062065, 062141, 081928.

PROPERTY

BOOTY 1; DAN 9,13,14,19; EAEC 1; JOHN; KEN 1; LONG; LOOT 1; MIDAS; MIDAS 1-3; PEGLEG 1 and 2; POLLY; RON 1; YAK 1 and 2.

LOCATION

The claims form a single block at Spider Lake (Fig. 8-47). They are 235 km north-northwesterly from Yellowknife.

HISTORY

In 1939 and 1940, the Ingray Lake area was mapped by the Geological Survey of Canada at 1:253,400 (Lord, 1942).

Gold was discovered in the Spider Lake area in 1945. That year the FLY No. 1 and FLY No. 2 groups were staked for Trans-American Mining Corporation Ltd. and the H.C., LUX, MEX and TEX claim groups for Springer Sturgeon Gold Mines Ltd. Trenching and sampling were performed by both companies (DIAND assessment reports 017382, 062065) in the fall of 1945. Spinet Mining Company Ltd. acquired the Trans-American and Springer Sturgeon claims in January 1946 and was succeeded by Spinet Gold Mines Ltd. in October 1946.

In 1946 and 1947, Spinet Gold Mines explored their property mainly by diamond drilling (DIAND assessment report 017382). Of a total of 5550 m drilled, 5026 m were to explore the North, South and East Zones, which are near the southernmost point of Treasure Island (Lord, 1951).

According to Lord (1951), drilling on the North Zone to a depth of 55 m (180 feet) indicated an ore shoot 23 m (75 feet) long with an average width of 2.6 m (8.5 feet) grading 7.9 g/t Au (0.231 oz/ton). The South Zone was drilled to a vertical depth of 107 m (350 feet) and an ore shoot 100 m (325 feet) long averaging 0.91 m (3 feet) wide grading 37.7 g/t Au (1.1 oz/ton) was indicated. The East Zone, 305 to 549 m (1,000 to 1800 feet) east of the South Zone, was reported to have been explored by a few drill holes, sections of which were auriferous.

Relatively little work was done on the Spinet Gold Mines property for the next two decades.

In 1960, the DAN group, on and south of Treasure Island, was staked and acquired by M.O. King. In 1963, the claims were transferred to Jason Holdings Ltd., which held most of them till October 1979. DAN 9, 13, 14, 19, which had been converted to a mining lease in 1972, were transferred to J.D. Mason in 1979. An airborne radiometric survey of DAN 9, 10, 13, 15, 19, 20, 23, and DAN X was performed in 1969 (DIAND assessment report 060413). Certificates of work were issued to Jason Holdings at various times but no record of this work remains in DIAND assessment files. The DAN lease was assigned to Suncor Inc. in 1985.

In 1967, Giant Yellowknife Mines Ltd. staked 18 JERRY claims west of Treasure Island on ground subsequently staked as the LONG and PEGLEG claims. Giant Yellowknife Mines mapped and sampled the peninsula east of Treasure Island and an area at the eastern end of Laurie Lake (DIAND assessment report 017734).

In 1970, Seigel Associates Ltd. flew a geophysical survey of the Damoti Lake-Indin Lake-Spider Lake area for Freeport Oil Company (Alberta) Ltd. to delineate volcanogenic massive sulphide targets. Several targets were outlined and secured by claim staking. These targets included one staked as the PETER claims (covering part of the ground earlier staked as the LUX and HC groups) at the south end of Spider Lake. One hole was drilled on the PETER claims (Padgham and others, 1978; DIAND assessment report 019699) which adjoined and lay south of the area now occupied by the PEGLEG 1 and YAK claims.

In 1980, Treasure Island Resources Corporation Ltd. calculated reserves from Spinet Gold Mines' 1946 and 1947 drilling to be 72,443 t (79,855 tons) grading 15.5 g/t Au (0.453 oz/ton Au). Treasure Island Resources Corporation recorded EAEC 1 in October 1978, BOOTY 1 in December 1979 and LOOT 1 in February 1980, and optioned DAN 9, 13, 14, 19 (DAN lease) and the YAK 1 and 2 (recorded January 1980) from J.D. Mason. In March 1983, Treasure Island Resources Corporation drilled eight holes totalling 920 m in the North and South Zones on Treasure Island.

From drill-core assays a reserve of 103,831 t (114,455 tons) grading 14.1 g/t Au (0.411 oz/ton Au) was calculated, with an additional 34,000 tons (30,845 t) grading 4.4 g/t Au (0.128

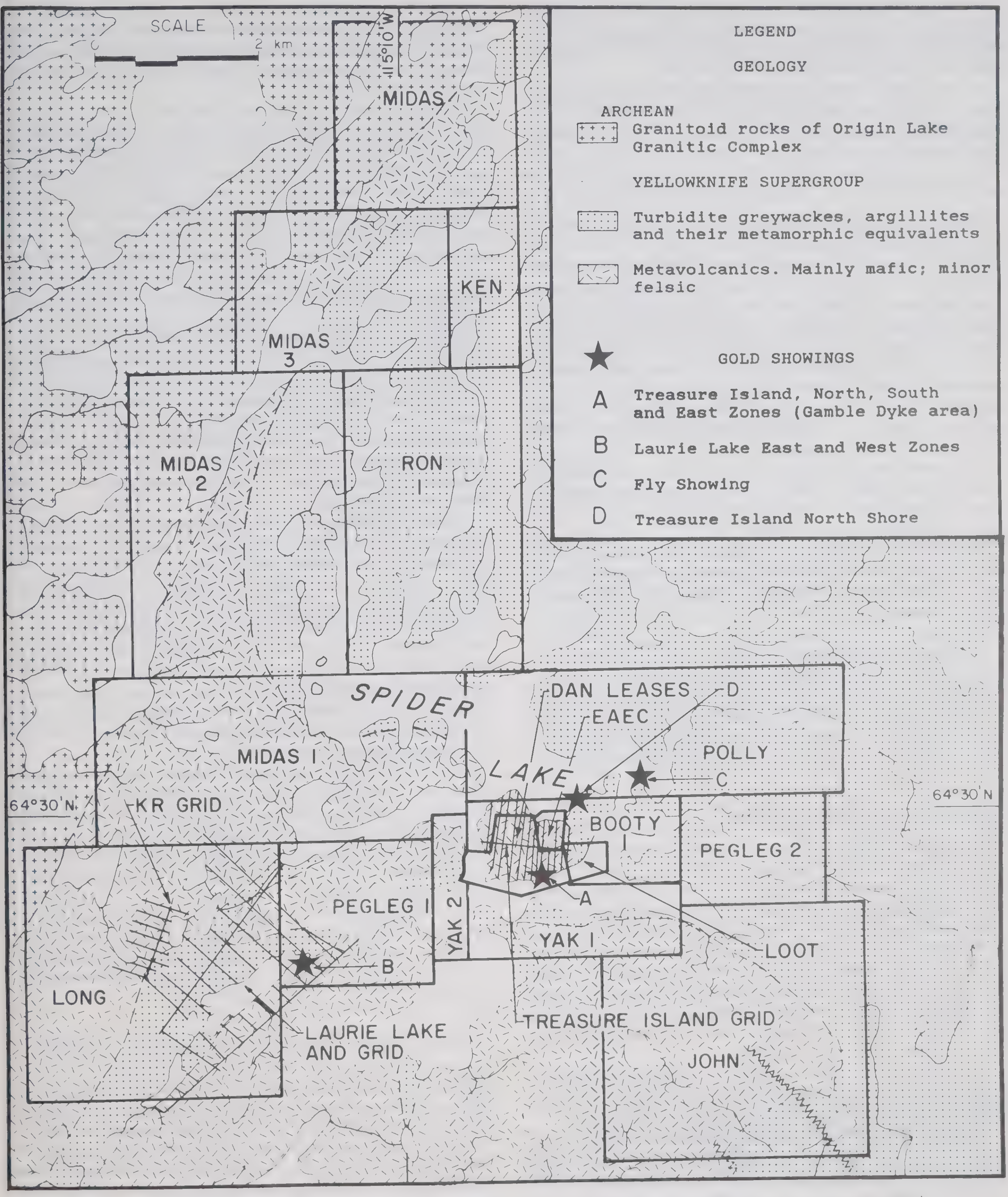


FIGURE 8-47: Geology and properties of the Spider Lake area (geology compiled from Stanton and others, 1954 and assessment reports).

oz/ton Au). Treasure Island Resources Corporation recorded PEGLEG 1 and 2 in January 1983 and LONG and JOHN in April 1983. They geologically reconnoitred EAEC 1 during the spring of 1983 (Seaton and Crux, 1985).

In May 1985, Suncor Inc. optioned the Treasure Island Resources Corporation property. Suncor recorded POLLY in April 1985, MIDAS 1-4 in June 1985 and KEN 1 and RON 1 in August 1985.

DESCRIPTION

Metasediments of the Yellowknife Supergroup underlie the northern arms of Spider Lake on KEN 1, RON 1, POLLY and PEGLEG 2. A belt of metasediments, less than 2 km wide flanked by metavolcanics, diverges from the main exposure (north and east of Spider Lake) and trends westerly to southwesterly through the southern part of Spider Lake and southwesterly through PEGLEG 1 and LONG. Much of the central (Treasure Island) and western parts of Spider Lake area are underlain by metavolcanics, flanked by metasediments to the southeast and granitoid rocks to the northwest. The granitoids underlie parts of LONG and MIDAS 1-4 on the northwestern border of the property.

The metavolcanic rocks in the Spider Lake area are predominantly mafic. Felsic volcanics have been mapped (Stanton and others, 1954) only on JOHN and YAK 1 and the northwestern part of LONG.

Structure in the Indin Lake-Spider Lake area is complex. Outcrop patterns of metasediments and volcanics suggest two or more periods of folding, modified by northeasterly striking and later (probably Proterozoic) northwesterly striking faults.

The North and South Zones (Lord, 1951) lie north and south respectively of the Gamble Dyke, an albite-porphyritic dyke that trends east-northeasterly through the southern point of Treasure Island. The dyke dips at 75°-85° to the north, is 6 to 12 m wide, and has been traced for about 455 m. It lies between metavolcanics to its north and metasediments to its south.

CURRENT WORK AND RESULTS

During 1985, Suncor explored the Spider Lake property by prospecting, linecutting, geological mapping, VLF-EM and magnetic surveys, sampling and trenching. A DIGHEM airborne geophysical survey was flown over most of the property. Three grids were constructed (Fig. 8-47); one on Treasure Island, and two to the west of Spider Lake on PEGLEG 1 and LONG (Laurie Lake and KR grids). A total of 49 line km of grid was cut. Grids were geologically mapped and explored by 30 line km of magnetic surveying, and 39 line km of VLF-EM, using both Seattle, Washington and Cutler, Maine transmission stations.

Over 430 rock samples were taken. Most were analysed for gold only; a few for gold and silver. Samples with analyses of over 1000 ppb Au were repeated by fire assay.

Prospecting beyond gridded areas resulted in discovery of two systems of northeasterly trending quartz veins near the eastern boundary of MIDAS 2. RON 1 and KEN 1 were staked to protect these.

Rock sampling on grids confirmed the presence of low concentrations of gold (mostly less than 2 g/t Au) in samples from gold showings trenched in the forties and resulted in discovery of a weakly auriferous zone near the northern shore of Treasure Island. Two trenches were excavated on this zone. Approximate locations of the various showings are shown in Figure 8-47.

Geological mapping by Suncor revealed that most of the gold showings are near or at the contact between metasediments and metavolcanics and that rocks near auriferous zones have generally been silicified. Biotite is abundant in the metavolcanics near their contact with metasediments at the main Treasure Island showings (near the Gamble Dyke) and at the Laurie Lake showings, where garnets were noted locally in volcanics adjacent to auriferous zones. Chlorite, actinolite and locally garnets were noted at the showing on the north shore of Treasure Island and at the East Zone.

Alteration, affecting both metavolcanics and metasediments for a distance of 10 to 15 m from the contacts of the Gamble Dyke is particularly conspicuous in the metavolcanics that have been converted to a chlorite-hornblende-biotite gneiss. Lord (1951) describes a 12 to 45 m wide unit of feldspar-amphibole-biotite gneiss adjoining amphibolite (metavolcanics) to the south. This unit presumably corresponds, at least in part, to the gneissic alteration zone described by Suncor.

Graphitic argillite is common (as elsewhere in the Indin Lake and other volcanic belts in the Slave Structural Province) at the metavolcanic- metasediment contact and commonly contains disseminated sulphides. The graphitic argillite in the Spider Lake area gives rise to EM, VLF-EM, resistivity and, locally, magnetic anomalies. Other features giving geophysical anomalies are: a carbonate unit bordered to the south by a slaty gossan-capped zone, in an area underlain by nodular quartz-biotite schist (metagreywacke) in the southwestern part of the Laurie Lake Grid; and, in the eastern corner of the same grid, a zone of magnetite-bearing iron formation that trends west-southwesterly.

A DIGHEM (magnetic, EM, VLF-EM, resistivity) survey was flown over most of the property, along flight lines oriented due north in the southern part of the property and northwesterly in the northern part. Long formational conductors delineated by the EM surveys followed major structural trends within metasediments or within metavolcanics near their contacts with metasediments.

The conductors are in part coincident with magnetic highs. Structural trends are also reflected in the resistivity data. Resistivity results also suggest that certain predominantly volcanic areas might contain thin, unmapped, metasedimentary units.

YELLOWKNIFE SUPRACRUSTAL BASIN

The Yellowknife Supracrustal Basin as defined by Padgham (1981) includes marginal volcanic belts (including the Yellowknife and Beaulieu River-Cameron River volcanic belts) and an extensive area of greywacke-mudstone turbidites and their metamorphic equivalents deposited distally to the volcanic belts. The basin includes granitoid plutons which intrude the supracrustal rocks; the larger ones having lobate outlines. The basin is bordered by Great Slave Lake to the south and gneissic terrain to the north.

The volcanic belts marginal to the basin host gold deposits and silver-base metal deposits. The turbidite sediments that fill most of the basin and the granitic rocks that intrude them host auriferous quartz veins and rare metal pegmatites.

BET, BIN, HID, LENS AND MUT CLAIMS

Equinox Resources Ltd.	Tantalum, Niobium,
500-576 Seymour St.	Lithium
Vancouver, B.C., V6B 5K1	85 I/1,2,7
	62°13′N, 112°42′W

REFERENCES

Henderson (1985); Jolliffe (1944); Kretz (1968); Lasmanis (1978); Rowe (1952); Seaton (1978); Wise and others (1985).
DIAND assessment reports: 080278-080280; 081132, 081875-081879.

PROPERTY

Name	ha	NTS	Lat.-Long.
BET 1-2	42.8	85 I/1	62°13′N, 112°18′W
BIN 1	18.6	85 I/2	62°13′N, 112°45′W
HID 1	21.6	85 I/7	62°18′N, 112°48′W
LENS 1	21.7	85 I/2	62°12′N, 112°41′W
MUT 1	19.1	85 I/2	62°13′N, 112°42′W

LOCATION

The claims are 87 to 112 km east-southeast of Yellowknife.

HISTORY

The claims are named after the rare-element-bearing pegmatites that they cover. These pegmatites have been explored since the early forties and have been the subject of numerous studies, including those by Jolliffe (1944), Kretz (1968), and Rowe (1952). One of the pegmatites (Bet pegmatite) was mined intermittently between 1958 and 1964 (Seaton, 1978). The lithium in these pegmatites is contained mainly in spodumene. Lasmanis (1978) estimated their lithium resource to a projected depth of 152 m as follows:

Pegmatite	Tonnes	Grade Li_2O
Lens	93,076	1.97%
Bin	89,901	1.75%
Hid	45,722	1.70%
Bet	38,737	2.00%
Mut	22,317	2.20%

Wise and others (1985) studied the tin, niobium and tantalum contents of these pegmatites and reported that only the Bet pegmatite carries tantalum and niobium-bearing minerals (ferrotantalite and ferrocolumbite respectively).

The claims were staked in 1975 and transferred to Canadian Superior Explorations Ltd. The BET claims were transferred to Cominco in 1980, to Erex International Ltd. in 1983, and to Equinox Resources Ltd. in 1985. The other claims were transferred to John Vincent in 1982 and to Equinox Resources Ltd. in 1985.

DESCRIPTION

The pegmatites are hosted in metasediments of the Yellowknife Supergroup (Henderson, 1985).

CURRENT WORK AND RESULTS

Trenches in the pegmatites were cleaned and examined for tantalum-bearing minerals, which were noted only in the Bet and Bin pegmatites. About 64 m³ of overburden and rubble were removed from eight trenches.

BRANDY 1 CLAIM

Genesis Resources Corp.	Gold
#405-319 W. Pender St.	85 I/7
Vancouver, B.C., V6C 1T4	62°25′N, 112°55′W

REFERENCES

Henderson (1985); Lord (1951).
DIAND assessment report 081798.

PROPERTY

BRANDY 1 (62.7 ha).

LOCATION

The claim is northeast of Hansen Lake, 80 km east of Yellowknife.

HISTORY

The property was staked in 1939 as NORMA 1-12 and acquired by Norma Tungsten and Gold Mines Ltd. About 14 t of high-grade ore from two pits on the Norma Vein were reportedly milled in 1942. In 1945 the property was acquired by Beaulieu Yellowknife Mines Ltd. Drilling in 1945-46 indicated 12.7 kt of ore grading 34 g/t Au in the A Zone. A shaft was sunk in 1947, and further development work indicated reserves of 95 kt grading 34 g/t Au. Milling commenced in October, 1947, and ceased about a month later when it became apparent that tonnage and grades were vastly overestimated. Lord (1951) reported that 230 t of milled ore yielded 230 g of gold for an average grade of 1 g/t Au. Another two-month mining attempt was made in 1948 when 190 t of ore yielded only 1.27 kg of gold for an average grade of 6.7 g/t Au. In 1949 the property was optioned to Treasure Island Corporation, but no work was done and the claims were allowed to lapse. They were restaked as BRANDY 1 in 1981 and transferred several times, most recently in 1983 to Genesis Resources Corporation.

DESCRIPTION

BRANDY is underlain by greenschist grade meta-turbidites of the Yellowknife Supergroup, (Henderson, 1985). The strata are well bedded and intricately folded. The Norma Vein, which appears to be a stratabound or stratiform quartz vein wrapped around the nose of an anticlinal structure was described by Lord (1951) as follows:

The Norma quartz vein outcrops on Norma No. 9 claim for a possible length of 1,800 feet. In plan it has the form of a large 'U', open to the north, with one major irregularity in curvature in its southern part. The eastern part of the vein trends southerly, lies about 70 feet west of the shaft, and has been traced, with some uncertainty and at scattered intervals, about 450 feet to a point 150 feet south-southwest of the shaft. Thence it bends abruptly westward and has been traced with reasonable certainty for 1,350 feet, first through successive courses of northwest, west, and southwest, then through an abrupt bend to the west, and thence finally through a long comparatively smooth curve to nearly north. The northeast and northwest ends of the vein outcrop pass beneath overburden. The vein averages 6 inches or less in width and rarely exceeds 18 inches. Throughout much, and possibly most, of its known length it lies within or at the top of a slate band, a few inches to 1 foot thick, that grades stratigraphically downwards into several feet of increasingly coarse-grained schistose greywacke. Thus, where the vein trends about west, as near pits "A" and "B" where the vein and beds dip northerly and the latter are overturned, the hanging-wall is slate or slaty greywacke of the vein-bed, and the foot-wall is a thin parting of slate of the same bed or coarse, basal greywacke of the contiguous, younger bed. Underground exploration showed the vein to be about 16 feet wide for a length of about 50 feet on the 175- and 300-foot levels.

The vein is composed mainly of rusty grey quartz, which, although greatly contorted, drag-folded, and fractured, precisely parallels the accompanying similarly distorted slate layer. Other narrower and shorter, but parallel and otherwise similar veins are common between the adjacent strata. The walls are generally sharply defined and not notably sheared. The quartz contains various proportions of black slaty rock, and a little carbonate, feldspar, scheelite, biotite, and chlorite. Specimens from the extreme northwest end of the exposed vein contained a few colourless hexagonal crystals identified as fluorapatite. A minute crystal of, probably, monazite was found embedded in the fluorapatite. Metallic minerals comprise much less than 1 per cent of the vein; pyrite is most plentiful, and others include arsenopyrite, galena, chalcopyrite, marcasite, spalerite (?), pyrrhotite (?), and gold. Much of the pyrite and most of the arsenopyrite occur as scattered crystals in the wall-rock and in inclusions of this rock. Visible gold is commonly associated with galena and other sulphide minerals.

Younger, coarse milky white or glassy quartz cuts the grey quartz of the Norma and parallel veins. It also transects the adjacent strata as veinlets that parallel the foliation, or as irregular bodies and interlacing veinlets concentrated near the axial parts of folds. This quartz is less fractured and contains more feldspar than the grey quartz. It contains a little pyrite, but is not known to contain significant amounts of gold.

The principal known concentrations of gold in the Norma vein are in the "A" ore shoot, 190 feet southwest of the shaft, and at "B" pit 630 feet farther west. The "A" ore shoot outcropped at "A" pit on the southwest flank of a sharp anticlinal fold, and at the surface lies 70 feet west of the axis of this fold. The orebody and vein strike west-northwest and dip about 70 degrees north-northeast. The plunge of the orebody parallels its dip. At the surface the shoot is 8 feet long, averages 16 inches in width, and is reported to contain 1.64 ounces of gold a ton; on the 175-foot level it has a drift length of 23 feet, averages 15 inches in width, and contains 0.55 ounces of gold per ton. Much greater widths of quartz have been exposed underground, as previously mentioned, but are not ore. No ore has been encountered on the 300-feet level although a little gold has been seen. Much of the slaty hanging-wall rock has been altered to a chloritic schist with which the quartz is in sharp contact. On the north wall of the "A" pit this schist outcrops as a rusty band 6 to 18 inches wide but probably ends a few feet east of the pit and ore shoot. The foot-wall rock is commonly a micaceous greywacke and, because it has been partly replaced by quartz, locally appears to grade into the vein quartz. Most of the visible gold is close to hanging-wall slate and schist or near inclusions of slate, and some occurs in chloritic seams in these inclusions. The notably sheared hanging-wall appears to be a feature confined to the vicinity of the ore shoot. Another structural feature unique to this part of the vein is a loop-like fold involving the beds immediately southwest of the ore shoot. The strata are here greatly contorted and broken, and the details of the structure are further obscured by numerous stringers and irregular bodies of milky quartz; nevertheless, the outcrop diameter of this loop-like structure may be about 60 feet. Possibly the presence of "A" orebody should be attributed, in part at least, to these two local structures.

At "B" pit the vein strikes west-northwest, and dips about 70 degrees north-northeast. Surface sampling by the owners indicated that approximately 40 feet of the vein averages 1 foot in width and contains more than 1 ounce of gold a ton. Diamond drill-holes in this vicinity probed the vein at shallow depths but, although some high-grade quartz was encountered, failed to outline a commercial orebody.

CURRENT WORK AND RESULTS

During March of 1984, two holes totalling 183 m were diamond drilled to confirm wide, high-grade gold intersections in the A Zone, as reported by Beaulieu Yellowknife Mines in 1946-47. Both holes intersected gold-bearing quartz veins, but grades and widths were far less than those reported by Beaulieu. The intersections are:

Hole #	Intersections	Width	Grade Au
84-1	82.0 m-82.9 m	0.9 m	1.99 g/t
84-21	66.1 m-67.0 m	0.9 m	2.81 g/t

The gold is associated with grey vein quartz and minor (less than 1%) pyrite.

WEAVER LAKE PROJECT

Noranda Exploration Co. Ltd.	Base metals, Silver, Gold
P.O. Box 45	85 I/9,10,11,15,16
Commerce Court W.	62°30′N-62°52′N
Toronto, Ont., M5L 1B6	112°14′W-113°07′W

REFERENCES

Henderson (1985); Padgham and others (1975).
DIAND assessment report: 081985.

PROPERTY

Claim	ha	NTS
BETH	585	85 I/10
BRIAN	439	85 I/10
CATH	418	85 I/10
FIDO	42	85 I/10
FIR 1-7	2154	85 I/16
JAN	251	85 I/10
JUD	502	85 I/11
KRAW	376	85 I/10
LONG 01-03	1296	85 I/9,10,15,16
MIKE	314	85 I/11
MOE	397	85 I/10,11
NORMA	84	85 I/10
PEG	125	85 I/10
SNOOT 1-2	669	85 I/11
SUE 1	251	85 I/10
TORK 1-2	192	85 I/10
VIC 01	188	85 I/11
XXX 01-04	732	85 I/10

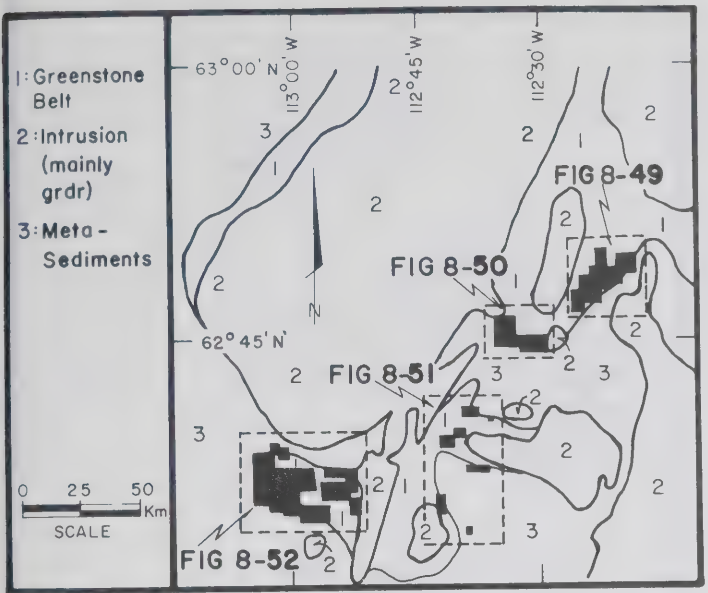


FIGURE 8-48: Index to Figures 8-49 to 8-52 (geology from Henderson, 1985).

LOCATION

The claims are in the northeast quadrant of NTS 85I is shown in Figure 8-48. The centre of the project area is about 100 km northeast of Yellowknife.

HISTORY

The area was prospected in the thirties for gold. Sulphides were discovered in the Turnback Lake area in 1937 and properties were explored by Westfield Minerals Ltd. (1939), Cominco (1951) and the Yellowknife Syndicate (1970) (Padgham and others, 1975). EM surveys were flown over the area in the early seventies by Teck Corporation and Great Plains Development, but little follow-up was done before operations were suspended. Since then, several junior companies have conducted small exploration programs. The Weaver Lake Project claims were staked by Noranda between September and December of 1983. Property selection was based on analysis of AEM anomalies from the 1971 Great Plains input survey and on the results of a prospecting survey conducted by Noranda in 1983.

DESCRIPTION

The claims are underlain by the Detour-Turnback lakes and Beaulieu River greenstone belts (Henderson, 1985; Fig. 8-48). These consist mainly of mafic volcanic rocks with subordinate felsic volcanics and minor interbedded metasediments. Most of the claims are centred on areas of felsic volcanic rocks.

CURRENT WORK AND RESULTS

AEM conductors from the 1971 Great Plains survey were ground checked by running lines of gravity, magnetometer and HLEM surveys. Magnetometer and HLEM surveys were conducted on detailed grids on the SUE and XXX 04 claims. Five holes totalling 400 m were drilled to test highest priority ground geophysical targets. Grids, survey lines, and diamond drill holes are shown in Figures 8-49 to 8-52.

The most significant results from drilling are as follows: hole K-1-84 on the SUE claims intersected 3.5 m of 0.4% Zn and 10.28 ppm Ag; hole A-1-84 on the SNOOT 1 claim intersected 8 m of 0.36% Zn, and hole C-1-84 on CATH intersected 0.5 m of 1.34 ppm Au.

MIK CLAIM

Ardic Exploration and	Gold
Development Ltd.	85 I/11
65 Broadway, 6th Floor	62°26'N, 113°26'W
New York, NY, USA, 10006	

REFERENCES

Henderson (1985); Schiller (1964).
DIAND assessment reports: 081351, 081774.

PROPERTY

MIK claim (83.6 ha).

LOCATION

The claim is 48 km east-northeast of Yellowknife.

HISTORY

The property was staked by Partridge Yellowknife Gold Mines Ltd. as the LUN group in the late thirties. In 1938, Thompson-Lundmark Gold Mines Ltd. was formed and the property became part of their holdings. They sampled two gold showings on the property, the Partridge and the Lun veins. Thompson-Lundmark Gold Mines Ltd. allowed the portion of their property now covered by MIK to lapse. In the fifties, the property was staked as the PLUTO group (Schiller, 1964). Subsequently it was staked as the WIN and GAY group by Mr. Avery, who excavated trenches and sampled the Partridge Vein (#1 Showing). From these trenches 9 bulk samples of unknown size and 40 chip samples were collected and assayed. Prior to the staking by Avery, some work was done on a third gold showing straddling the south boundary line of the property. Considerable trenching was done and at least two holes were drilled. No additional information is known of this work. The property was restaked by Dave Nickerson as the MIK claim in September 1979. In 1981, the old pits and trenches were cleaned out, mapped and sampled. Of 51 chip samples assayed, only 3 exceeded 8.6 ppm Au (maximum 72.7 ppm) and 42 were less than 3.4 ppm (DIAND assessment report 081351).

DESCRIPTION

The claim is underlain by amphibolite-grade metaturbidites of the Yellowknife Supergroup (Henderson, 1985). Strata trend 130° to 170° and dip uniformly to the east at 40° to 60°. On the eastern boundary of the property, there are indications of an isoclinal fold with closure to the south and an overturned curvilinear axial surface. The sediments are cut by pegmatite dykes and at least two generations of quartz veins. The auriferous veins generally are conformable to bedding. Barren veins occupy joints that are sub-parallel to bedding

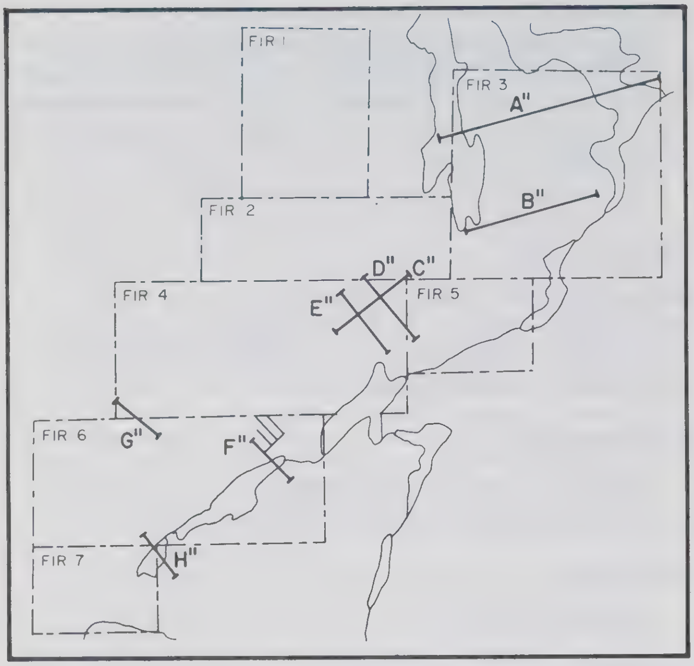


FIGURE 8-49: Grids and geophysical traverses, FIR claims. See Figure 8-48 for location.

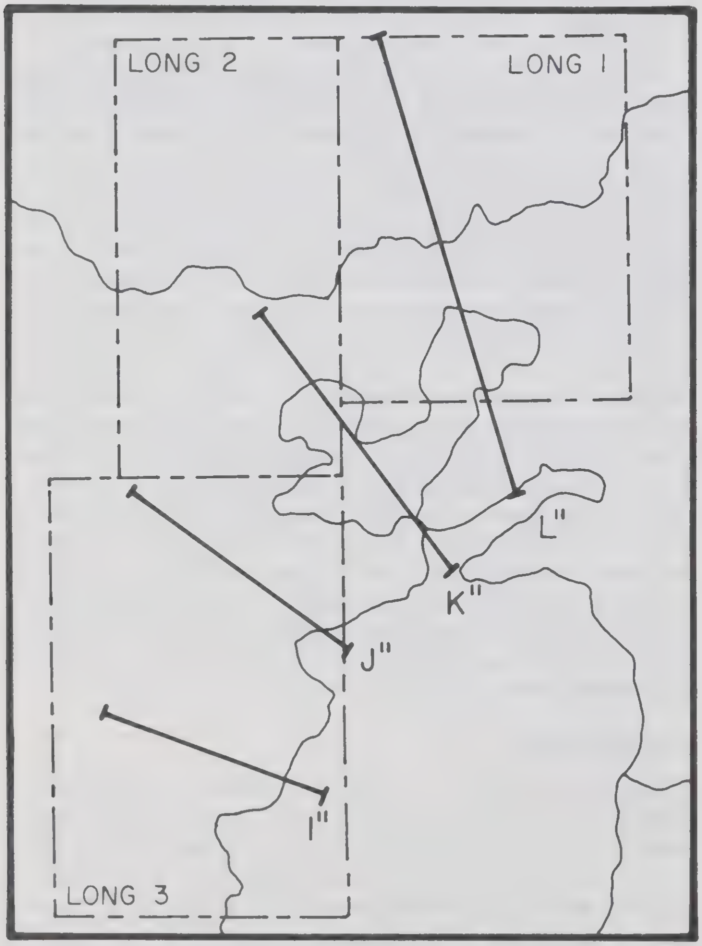


FIGURE 8-50: Geophysical traverses on the LONG claims. See Figure 8-48 for location.

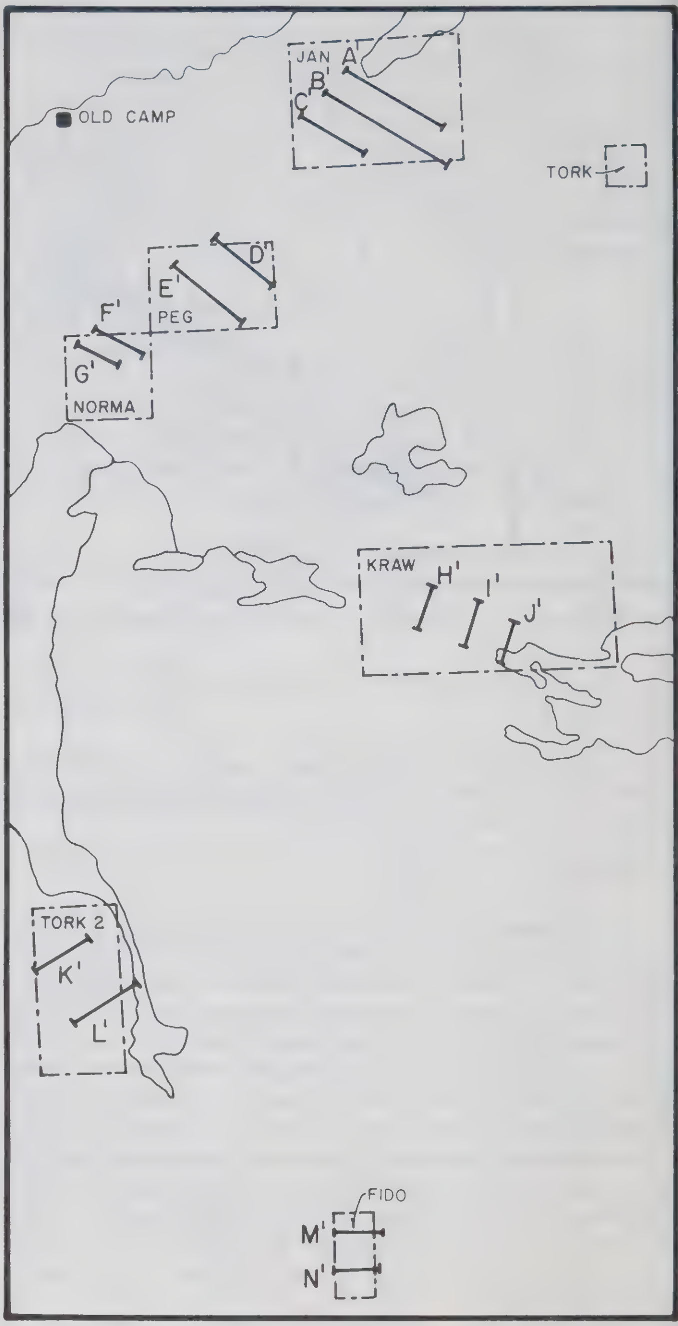


FIGURE 8-51: Geophysical traverses on the JAN, PEG, NORMA, KRAW, TORK and FIDO claims. See Figure 8-48 for location.

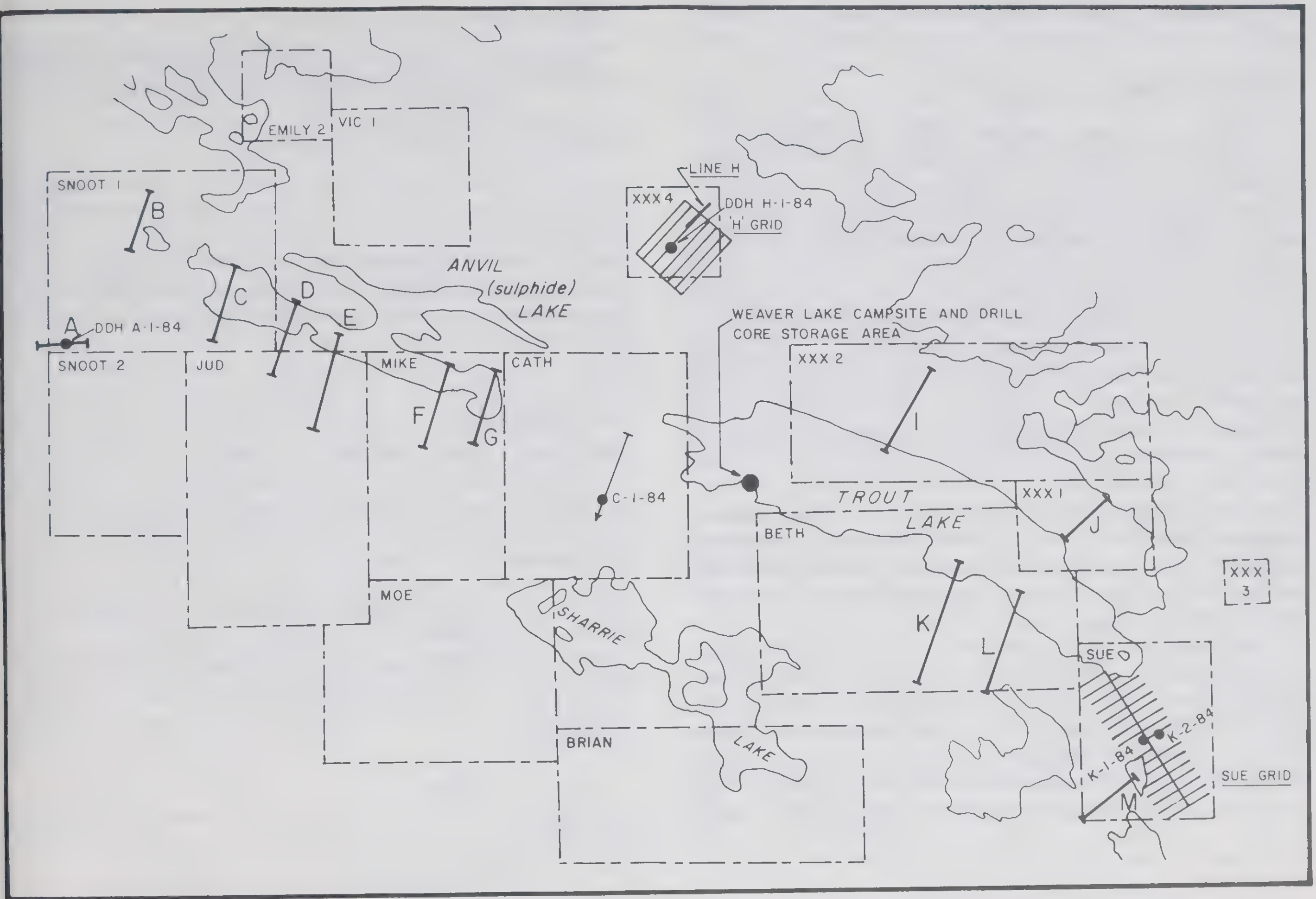


FIGURE 8-52: Geophysical traverses, grids and diamond drill hole locations on Noranda claims in the Anvil Lake area. See Figure 8-48 for location.

and dip west. The auriferous veins are narrow and contain minor tourmaline, galena, sphalerite, pyrrhotite, arsenopyrite, pyrite and chalcopyrite.

CURRENT WORK AND RESULTS

In 1984 the MIK claim was prospected, sampled and mapped during a 44-day program conducted by H.E. Neal and Associates Ltd. of Toronto. Forty-six chip samples of quartz vein assayed from trace (38 samples) to 2.2 ppm Au.

COVE 1, TCS 2 CLAIMS

Tantalum Mining Corp.	Tantalum, Tin
of Can. Ltd.	85 I/11,12
P.O. Box 28,	62°38'N, 112°30'W
Toronto-Dominion Centre	
Toronto, Ont., M5K 1B8	

REFERENCES

Henderson (1985); Lord (1951); Seaton and Crux (1985). DIAND assessment reports; 081683, 081885.

PROPERTY

COVE 1 (495 ha) and TCS 2 (514 ha).

LOCATION

The claims are 50 km east-northeast of Yellowknife

HISTORY

The claims were staked in 1981-1982 to cover ground favourable for tantalum- tin-bearing pegmatites. The properties are centered on the Freda Pegmatite dyke, which was mined for tantalite in 1946 (Lord, 1951) and is now held by Cominco (TABE claim). In 1982, a number of pegmatite dykes on COVE and TCS were sampled and analyzed for tantalum and tin but results indicated sub-economic concentrations (maximum 0.028% Ta_2O_5, 0.47% SnO). A lithium lithogeochemical survey was also done in 1982 (Seaton and Crux, 1985).

DESCRIPTION

The claims are underlain mainly by metaturbidites of the Archean Yellowknife Supergroup, but mafic to intermediate volcanics are also present (Henderson, 1985). Pegmatites

cutting the sediments trend northwesterly and dip 50° to 80° west.

CURRENT WORK AND RESULTS

In 1983, a lithogeochemical survey was completed to delineate blind tantalum-tin-bearing pegmatites. The premise for this survey is that the emplacement of tantalum-tin-bearing pegmatites is accompanied by extensive metasomatism of the country rocks by the elements lithium, cesium and rubidium. Of these, lithium is the most mobile and can be expected to migrate the farthest, forming aureoles around the pegmatites. Rubidium is the least mobile and forms much thinner and less intense aureoles. Commonly, a rubidium anomaly forms a relatively narrow zone around an individual pegmatite, resulting in a rubidium low or depression immediately over top of the pegmatite. The lack of mobility of rubidium relative to cesium is offset by higher crustal abundance of rubidium.

The bedrock was sampled at 75 m intervals along chained compass lines 300 m apart. At each station approximately 0.5 kg of fresh chip sample was taken. The samples were analyzed for Rb_2O; the results were plotted on a base map and contoured.

In general, the contoured results reveal a very noisy rubidium signature; the anomalies have tight, northerly trending, composite features. The anomalies defined by the previous lithia survey are not as well defined by the rubidium survey and direct correlation with the lithia anomalies is fair. The rubidium anomalies (maximum 200 ppm) are not intense and contrast poorly with the general background levels (about 60 ppm).

The claims were allowed to lapse in 1985.

RUSH CLAIM

John U. Bayly	Gold
Box 2882, Ste. 305	85 I/14
Laurentian Bldg.	62°46.5'N, 113°20'W
Yellowknife, NWT	

REFERENCES

Henderson, J.B. (1985).
DIAND assessment report: 081779.

PROPERTY

RUSH claim (41.8 ha).

LOCATION

The claim is south of Gordon Lake, 65 km northeast of Yellowknife.

HISTORY

The claim was recorded by C. Donaldson in 1979 and transferred to Archie Mandeville in 1981 and to John V. Bayly in 1984.

DESCRIPTION

The claims are underlain by highly folded greenschist-grade turbidites of the Burwash Formation (Henderson, 1985).

CURRENT WORK AND RESULTS

Four holes totalling 61 m were drilled in 1985 to evaluate auriferous quartz veins. The best assay obtained was 17.6 ppm Au across 0.43 m in a massive white quartz vein carrying sericite inclusions and 2% pyrite. The adjacent wall rocks are graphitic argillites containing relatively barren quartz veins and stringers. The second best assay was 2.8 ppm Au across 1.28 m.

GBI CLAIMS

Great Bear Explorations Inc	Gold
c/o John Foster	85 I/14
Monte Lake, B.C., VOE 2N0	62°47'N, 113°15'W

REFERENCES

Henderson, J.B. (1985); Henderson, J.F. (1941); Lord (1951); Riddle (1939).
DIAND assessment reports: 017323, 017372, 081471, 081802.

PROPERTY

GBI 1,2 (479 ha).

LOCATION

The claims are 69 km northeast of Yellowknife.

HISTORY

Prospectors working for Dome Mines Ltd. found a number of gold showings south of Gordon Lake during the summer of 1938. A group of 43 claims, known as the SDC group, was staked in July 1938 and some trenching and diamond drilling was carried out.

In 1939, a detailed program of mapping, trenching and bulk sampling was conducted, and Dome concluded that further work would have been warranted had the property been in a less remote district. They estimated that grades averaging 17 ppm Au would be needed to make the property economic. Dome did no further work and allowed the claims to lapse in the late forties. Because of the low price of gold, which prevailed throughout the fifties and sixties, little work was done on the property.

In 1967-68, the property was acquired by Chemalloy Minerals and limited trenching and sampling were done. The claims were allowed to lapse because of low gold prices.

In 1973-74, Precambrian Shield Resources Ltd. acquired part of the old Dome holdings and carried out extensive exploration work around the main showing (shaft location on Fig. 8-53). This work included driving a decline and about 300 m of drifting and crosscutting, as well as considerable underground drilling. The company stated that the program had developed an indicated grade of 5.14 ppm Au over an average width of 13 m with a potential of about 1800 t per vertical metre.

The western third of the original Dome property was acquired by Great Bear Explorations Inc. in 1974. The subsequent fall in the gold price resulted in the claims being dropped after some very preliminary evaluation.

Great Bear Explorations restaked this ground as GBI 1 and GBI 2 in 1980 and 1981.

DESCRIPTION

The area was mapped by J.F. Henderson (1941) at 1:63,360 and by J.B. Henderson (1985) at 1:250,000. The claims are underlain by tightly folded greenschist-grade turbidites (greywacke and argillite) of the Archean Burwash Formation. Riddle (1939) reported a number of banded iron formation units in the area comprising metre-thick continuous beds of dark, graphitic schist containing numerous seams of disseminated pyrite along cleavage planes. The metasediments are intruded by Proterozoic diabase dykes.

At least five gold showings, discovered in earlier years, are on the GBI claims (Fig. 8-53). Showings 5 and 6 comprise lenses and stringers of white and grey quartz intruded into beds of contorted and sheared argillites and argillaceous greywackes. These form irregular zones up to 30 m wide and 100 m long containing from 10% to 15% quartz.

Visible gold associated with fractured quartz and massive arsenopyrite has been reported in trench samples. The best assay from Zone 6 was 72 ppm Au from a 0.9 m channel sample in a trench.

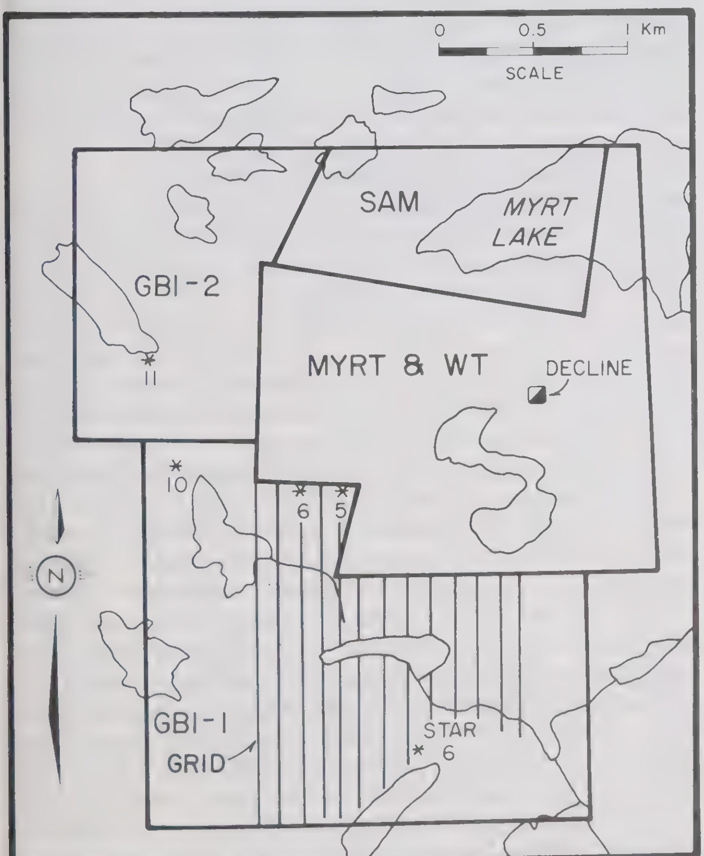


FIGURE 8-53: Showings and grid on the GBI claims. The property is underlain by turbidites.

Showing 11 comprises stringers and veins of white and grey quartz in an argillaceous greywacke bed. The veined zone is about 275 m long and up to 24 m thick. The best assay obtained from this zone was 6.2 ppm Au from a 0.61 m channel sample in a trench.

No description is available for the Star 6 showing, but seven samples were assayed, yielding from trace to 67 ppm Au.

Showing 10 is a large pod of grey quartz intruded along the contact of sheared graphitic schist and massive greywacke. Visible gold was observed in a 6 by 0.6 m section of the quartz pod. Accessory minerals include arsenopyrite, pyrite, pyrrhotite, galena, chalcopyrite and feldspar. A chip sample collected in 1974 assayed 28.5 ppm Au across 2.1 m. Assay results from samples collected outside of the zone of visible gold were not encouraging.

CURRENT WORK AND RESULTS

A rock geochemical survey was conducted in 1984 to test the gold content of host rocks and previously unsampled quartz stringer zones on the property. A grid (Fig. 8-53) was established on GBI 1 and samples consisting of 10 small rock chips from a 1 m² zone were collected at 50 m intervals where possible along lines. A total of 228 samples (of ten chips each) were sampled and analyzed for gold and silver. Most of the samples (76%) contained less than 5 ppb Au. The best anomaly was 215 ppb Au. No clusters of gold anomalies were detected. Most of the samples contained less than 0.1 ppm Ag. The best anomaly, 2.9 ppb Ag, did not correspond with a gold anomaly. No clusters of silver anomalies were detected. Eighteen quartz-vein zones on the grid were sampled and assayed. The best assay was 0.6 ppm Au.

CLAM CLAIM

Canadian-United Minerals Inc.	Gold
#215, 543 Granville St.	85 I/14
Vancouver, B.C., V6C 1X8	62°55′N, 113°19′W

REFERENCES

Henderson, J.B. (1985); Henderson, J.F. (1941). DIAND assessment report: 082048.

PROPERTY

CLAM 1 (105 ha).

LOCATION

The claim is 70 km northeast of Yellowknife.

HISTORY

According to a local prospector, Charles Vaydik, trenches near the southeast corner of the claim were excavated in 1946, but there is no record of this work in DIAND assessment files. A grab sample collected from one of these trenches in 1980 by Giant Yellowknife Mines Ltd. assayed 190.6 ppm Au. CLAM 1 was recorded in 1984 and partly envelopes a smaller claim (CINDY 1) recently staked by Mr. Charles Vaydik.

DESCRIPTION

The claim is underlain mainly by greenschist-facies metasediments of the Burwash Formation (Henderson, 1985; Henderson, 1941). These comprise a northwesterly striking, sub-vertically dipping succession of interbedded greywacke and argillite that have been intruded by quartz veins and diabase dykes.

CURRENT WORK AND RESULTS

A one-day evaluation of the claim was carried out by Mr. Lou Covello in May, 1984. An area of quartz stockwork comprising 20% quartz veins across 150 by 40 m was identified north of the trenches. The veins are north-trending, up to 10 cm thick, and contain sparse pyrite, galena and sphalerite at one locale. No assays were reported, but channel sampling of the stockwork zone was recommended.

MQ GROUP

Black Ridge Gold Ltd.	Gold
520 Lincoln Bldg.,	85 I/14
W. 818 Riverside Ave.	62°56′N, 113°12′W
Spokane, Wa., 99201	

REFERENCES

Henderson, J.B. (1985); Henderson, J.F. (1941); Lord (1951).

DIAND assessment reports: 080981, 080892, 081574, 081762, 081939.

PROPERTY

AUR 1-3 (627 ha), JAL (105 ha), MCC (146 ha), and MQ 1 (21 ha).

LOCATION

The claims are on the east shore of southern Gordon Lake, 80 km north-northeast of Yellowknife.

HISTORY

The area was staked as the DAF claims in 1946 by J.R. Woolgar and G. Wonnacott. In 1947 the owners erected a mill and recovered 1.55 kg of gold from about 16 t of ore. The property was acquired by West-Bay Yellowknife Mines Ltd. in 1948, a new mill was erected, and 6.89 kg of gold were recovered from 262 t of ore.

In 1977, the ground formerly covered by DAF 4 was restaked as MQ 1 by Mr.John Doucette and acquired by Black Ridge Gold in 1981. The other claims were added in 1983 and 1984.

During 1982-83, Black Ridge drilled 426.7 m in 20 holes. The best intersection assayed 686 g/t Au across 0.46 m. In 1984, Cruiser Minerals Ltd. signed an agreement with Black Ridge to explore the property, and 24 holes totalling 1209 m were drilled. This work established reserves of 5 kt grading 30.4 g/t Au in an ore shoot 18 m long by 91 m down dip by 1.37 m wide.

DESCRIPTION

The MQ group area was mapped by J.F. Henderson (1941) at 1:63,360 and by J.B. Henderson (1985) at 1:250,000. The claims are underlain by greenschist-grade turbidites (greywacke and argillite) of the Archean Burwash Formation. The sediments have been isoclinally folded into a series of overturned anticlines and synclines, and cut by several Proterozoic diabase dykes. Bedding tops generally face north, fold axes trend northeast, and beds dip 75°-85° easterly. A gold-bearing quartz vein (Main Vein), mined in the forties, occupies the nose of a syncline that opens and youngs to the northeast. A pit measuring about 30 m long, up to 7.6 m wide and 9 m deep marks the site of the former mining operations. The Main Vein varies from thin stringers to a solid mass up to 6.1 m thick, and can be traced in outcrop and old trenches for about 43 m. Only a third of that strike length is ore bearing, but, the ore shoot has been traced down plunge (about 52°) to the northeast for at least 100 m. The Main Vein consists of dark grey and white quartz containing minor pyrite, galena and chalcopyrite. A more detailed description is given by Lord (1951).

CURRENT WORK AND RESULTS

Detailed Grid

A detailed grid, 150 m by 150 m, consisting of 21 east-trending crosslines and 3 north-trending baselines (3.7 line km of cut line), was established on the Main Vein. This grid provided survey control for the detailed geological, geophysical and geochemical surveys that were done in 1985.

The grid area was geologically mapped at 1:240. Only two rock types were observed, greywacke and argillite, with the former predominating as thick, monotonous beds. Mapping confirmed that the Main Vein occupies the nose of an overturned syncline whose axis trends about 040°.

Geophysical surveys included magnetometer and VLF-EM. Magnetometer readings were taken at 3.8 m intervals on all cut lines. There is a weak magnetic low over the Main Vein. Several strong near-surface anomalies may be due to concentrations of pyrrhotite and magnetite, which are common accessories in the greywackes and argillites. Magnetic anomalies were also obtained over some sheared slate beds containing quartz veins. VLF-EM readings were taken at 3.8 m intervals along all cut lines using the Seattle, Washington transmitter. No conductors were detected.

The geochemical survey consisted of sampling immature B-horizon soils every 3.8 m along cut lines. A total of 322 samples, 37.4% of the possible maximum (many samples stations were underlain by outcrop or muskeg) were collected and analyzed for gold, silver, arsenic, copper and lead. A 40 ppb Au contour effectively outlines zones of interest, although results were as high as 4000 ppb Au. An anomalous zone (greater than 40 ppb Au) around the Main Vein is about twice as large (73 by 30 m) as the vein itself. No significant silver anomalies were found. Arsenic anomalies (greater than 15 ppm As) generally mimic gold anomalies. Some copper (greater than 40 ppm) and lead (greater than 20 ppm) anomalies were outlined and although they generally mimic gold anomalies, their distribution is erratic and appears to preclude their use as pathfinder elements.

Ten channel samples, each almost 1 m long, were collected

from various veins within the detailed grid area and assayed for gold. Most assays were less than 0.03 g/t Au, the best assay was 2.27 g/t Au.

Main Grid

The main grid consists of a 1.8 km picketed baseline (Fig. 8-54) with 31 blazed and flagged winglines at 60 m intervals and 11 fill-in lines. This grid, which covers 1.8 by 1.1 km, provided survey control for the geological, geophysical and geochemical surveys.

The main grid was mapped at 1:1200. With the exception of a 7.6 m wide diabase dyke striking about 320º across the northern portion of the grid, only greywacke and slate were observed. The beds generally strike northeasterly and face northerly. Quartz veins several centimetres wide are common along the margins of argillite beds. They are probably the result of remobilization of silica from greywacke during metamorphism and precipitation along the more impermeable argillite units. Several larger quartz veins were found, but no significant gold assays were obtained despite repeated trenching and sampling.

Geophysical surveys on the main grid consisted of magnetometer and VLF-EM. Magnetometer readings were taken at 7.6 m intervals along all lines. Numerous small anomalies were obtained, but no specific causes could be found despite detailed prospecting. Quartz veins usually appear to occupy narrow (15 to 30 m) magnetic lows flanked by zones of somewhat higher magnetic response. The VLF-EM survey outlined several strong conductors. One anomaly occupies a gully and is suspected to be caused by a bedding plane fault. A soil sample from the gully yielded 30 ppb Au, the best anomaly obtained from the main grid. Another anomaly concides with a quartz-vein swarm that was trenched in earlier years, but which failed to yield significant gold assays. A long, linear anomaly corresponds to a mapped anticlinal axis.

A total of 330 B-horizon soil samples were collected, mainly from the central part of the main grid, and analyzed for gold and arsenic. All samples returned less than 5 ppb Au except for the 30 ppb anomaly discussed previously. Some As anomalies (greater than 30 ppm) were found, but did not correlate with geological or geophysical targets.

Peninsula Grid

Work done on the grid consisted of soil sampling and geophysical surveys to evaluate quartz-veined zones from which assays of as much as 3.4 g/t Au across 4.6 m were obtained. Twenty-three soil samples were analyzed, yielding three gold anomalies (15 to 60 ppb) and four arsenic anomalies (110 to 210 ppm). The area of widest quartz veining is a moderate magnetic high flanked by magnetic lows. No VLF-EM conductors were identified.

Prospecting Program

That part of the property not covered by grids was prospected by traversing at intervals of about 350 m. A total of 29 soil samples was collected in the vicinity of a prominent fault extending across the central part of the claim group, but no gold anomalies and only one weak arsenic anomaly were obtained. Quartz veins were sampled, but only two yielded significant gold anomalies. A flagged, 120 by 120 m grid (Peninsula Grid of Fig. 8-54) was established to cover these showings.

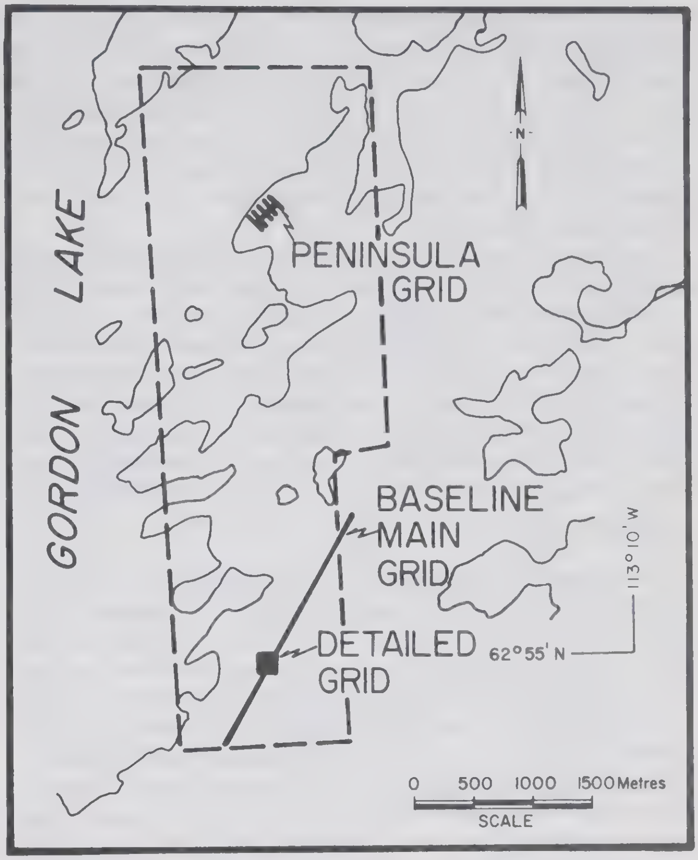


FIGURE 8-54: Outline of the MQ group showing the positions of the detailed grid, the Peninsula grid, and the baseline of the Main grid. The claims are underlain by turbidites.

AM AND GB CLAIMS

Salish Resources Ltd.	Gold
Suite 715,	85 I/14
675 W. Hastings St.	62º56'N, 113º20'W
Vancouver, B.C., V6B 1N2	

REFERENCES

Henderson (1985); Henderson (1941).
DIAND assessment report: 081927.

PROPERTY

AM (42 ha) and GB 1-2 (836 ha) claims.

LOCATION

The claims are southwest of Gordon Lake on the south side of Knight Bay, about 85 km north-northeast of Yellowknife.

HISTORY

The property was staked as the TREACY group in September, 1946. Four gold-bearing quartz zones on the claims received varying amounts of surface exploration consisting of trenching, sampling and mapping. A limited amount of diamond drilling was carried out on the showings during early exploration. In 1951, a crude 3 tpd rocker-bed mill was installed on the property at the site of the No. 1 and 2 Zones

by Boreas Yellowknife Gold Mines Ltd. The feed for this mill came from a 5 by 1.2 m zone in the No. 1 Trench. Five channel samples taken across this mineralized pod ranged from 4 ppm Au across 90 cm to 196 ppm Au across 90 cm. About 5 t of tailings in one of the trenches and about 30 t of broken ore, some of which has been crushed, are still at the site. The mill was very inefficient and only a small amount of gold was recovered.

The No. 1, 2 and 3 Zones were geologically mapped and resampled by Consolidated Northland Mines Limited in 1958. In 1963, the entire property was geologically mapped and the No. 1 and 2 Zones again sampled by Expander Mines and Petroleums Ltd. The TREACY claims were taken to lease for 21 years in May, 1959 and then allowed to lapse in 1980. In 1982, AM was staked by Dave Nickerson of Yellowkife, NWT. GB 1 and GB 2 were added to the group in late 1983 and the entire group has been purchased by Salish Resources Ltd.

DESCRIPTION

The property is underlain by greenschist-grade metaturbidites of the Archean Burwash Formation (Henderson, 1985; Henderson, 1941). Irregularly shaped quartz veins are very common on the property. Two types of quartz are recognized macroscopically: grey and white. Grey quartz varies in colour from light grey to bluish grey and is, at least locally, cut and injected by white quartz veins. There appears to be no distinction between the white and grey quartz with respect to gold mineralization. Both types form pods or nests, are always related to folding, and form along the axis or on the saddles of folds. Secondary quartz veins crosscutting all structures are always white.

Three isoclinal fold axes have been mapped on the property. These appear to have been subsequently re-folded by younger deformation forming gentle open warps. The quartz veins are localized along the limbs of the isoclinal folds.

Sulphides in quartz veins and adjacent country rocks are predominantly pyrite, pyrrhotite and arsenopyrite. Trace amounts of chalcopyrite, galena and sphalerite may be present. Gold is incorporated in the arsenopyrite crystal structure but visible free gold is also present. Arsenopyrite is generally restricted to the sediments adjacent to quartz vein or stringers, while the free gold is usually in or directly adjacent to the quartz. Vein quartz constitutes less than 10% of the rock in the area.

CURRENT WORK AND RESULTS

A 7.6 line km grid was established over the central part of the property. North-trending winglines were cut at 60 m intervals and chained at 30 m intervals. A VLF-EM survey on the grid did not reveal any anomalies. Mapping (1:1200) and prospecting on the grid delineated four gold showings (Zones 1-4) on the flanks of isoclinal folds. Two NQ holes totalling 103.6 m were drilled to test two showings. Hole 85S-01, drilled southeast of the exposed end of Zone 3, did not intersect significant gold. Hole 85S-02, collared on the west side of Zone 1, intersected two weakly mineralized zones (1.95 ppm Au across 2.2 m and 1.81 ppm Au across 2.0 m). Geochemical analyses of 29 grab samples ranged from less than 5 ppb Au to 1850 ppb Au, with one sample greater than 10,000 ppb Au. A one-day reconnaissance prospecting program on the property did not find other showings.

BEAR CLAIMS

Silver Hart Mines Ltd.	Gold
209, 320 Sioux Road	85 I/16
Sherwood Park, Alta., T8A 3X6	62°53′N, 112°26′W

REFERENCES

Henderson (1976).
DIAND assessment report: 081902.

PROPERTY

BEAR and BEAR 1, 2.

LOCATION

The claims are at and directly east of Amacher Lake, 110 km northeasterly from Yellowknife.

HISTORY

The BEAR claims were recorded in February 1983.

DESCRIPTION

The claims are underlain by mafic volcanics, granodiorite and minor amphibolite.

CURRENT WORK AND RESULTS

In 1984, ten diamond drill holes totalling 819 m, tested a silicified, carbonatized and arsenopyrite-bearing zone in metavolcanics (chlorite and chlorite biotite schists). A number of narrow, weakly auriferous zones were intersected. The best assay was roughly 8 g/t Au across 1 m.

MARLIN CLAIMS

Golden Marlin Mines Ltd.	Gold
Box 54	85 J/1,7,8
Langham, Sask., S0K 2L0	62°18′N, 114°28′W

REFERENCES

Baragar (1966); Boyle (1961); Helmstaedt and others (1979); Helmstaedt and Padgham (1985); Henderson (1970, 1975, 1976, 1978); Henderson and Brown (1966); Jolliffe (1942, 1946); Seaton (1978, 1983a); Seaton and Hurdle (1978).
DIAND assessment reports: 081871, 081872, 081873.

PROPERTY

MARLIN 1-31.

LOCATION

The claims are 10 to 25 km southerly from Yellowknife and cover much of the outer part of Yellowknife Bay, including the West Mirage and many of the East Mirage Islands (Fig. 8-55).

HISTORY

The northern part of the MARLIN claim block was, in part, previously covered by the YT group, the history of which is

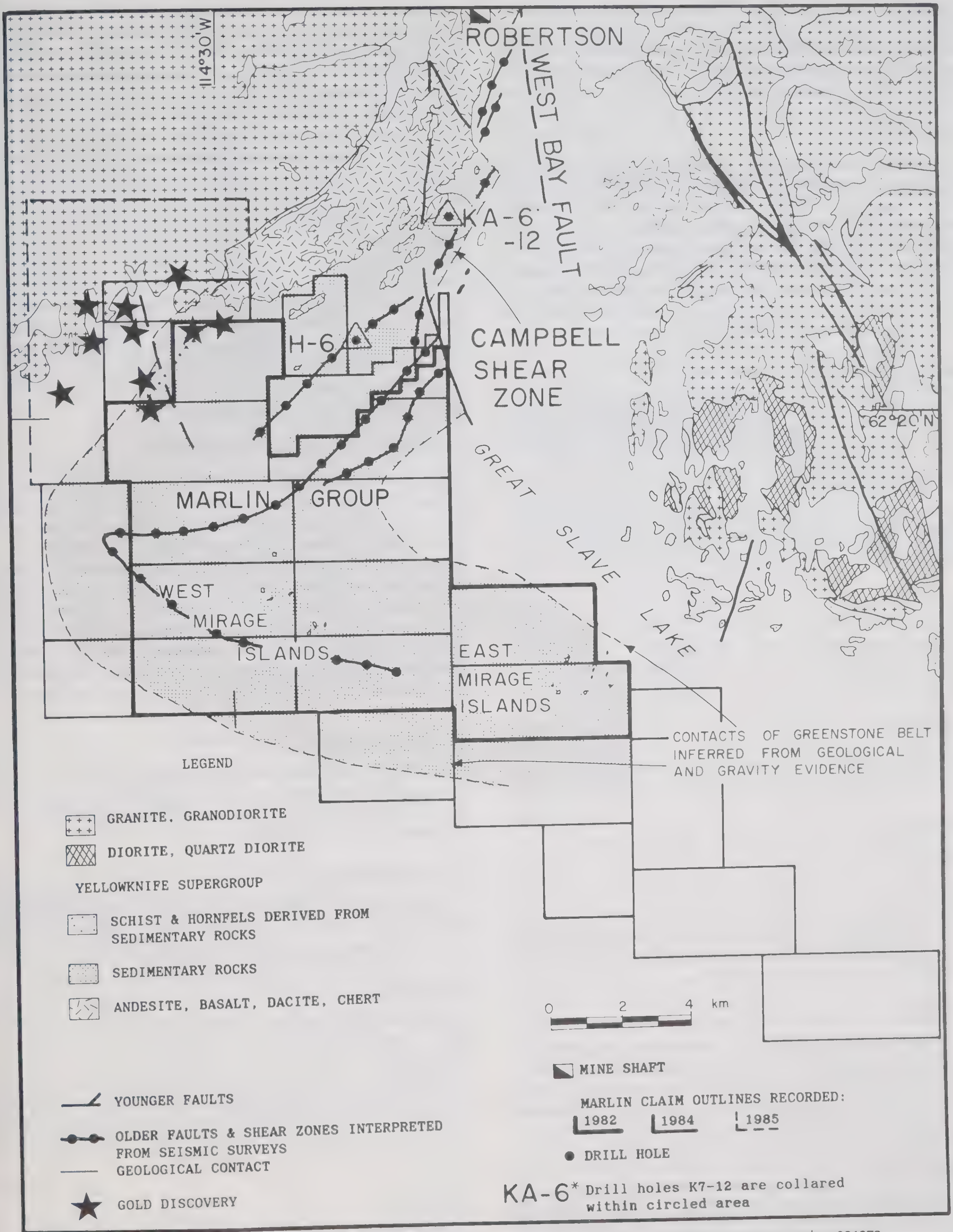


FIGURE 8-55: MARLIN claims, Yellowknife Bay. Compilation of claim data and geology from DIAND assessment report 081873.

summarized in Seaton (1978, 1983a) and Seaton and Hurdle (1978).

MARLIN 1-10, 4A and 5A were recorded in February 1982. MARLIN 14-28 were recorded in July and October 1984 and MARLIN 29-31 in September 1985.

DESCRIPTION

The claims cover an area at the mouth of Yellowknife Bay where islands of Archean volcanics and gabbroic sills, locally cut by Proterozoic diabase dykes, outcrop at or near the southernmost end of the Yellowknife Volcanic Belt. The northern part of this area has been mapped by Helmstaedt and others (1979). Other references cited cover the geology of the Yellowknife Volcanic Belt as a whole, the geochemistry and genesis of its gold deposits (Boyle, 1961) and its geochemistry (Baragar, 1966).

CURRENT WORK AND RESULTS

During 1984, work included geological mapping, prospecting, sampling (including underwater sampling using scuba - equipment), and marine seismic surveying. Four gold showings were discovered.

In 1985, work consisted of an IP survey over lake ice, overburden drilling, additional water-borne seismic surveying, aerial photography and a helicopter-borne magnetic and EM survey.

TREM CLAIMS

Treminco Resources Ltd.	Gold
1110-625 Howe St.	85 J/8,9
Vancouver, B.C.	62°32′N, 114°12′W

REFERENCES

Henderson (1985); Jolliffe (1946).
DIAND assessment report: 082052.

PROPERTY

TREM 1-5.

LOCATION

The claims are south of Prosperous Lake, about 8 km northeast of Yellowknife. They are accessible by road from Yellowknife via the Ingraham Trail.

HISTORY

The Yellowknife area has been intensively prospected for gold since the thirties. The TREM claims cover ground previously staked as the AVI and RANEL groups, but there is no record of work done on these claims in DIAND assessment files. The TREM group was recorded in 1984.

DESCRIPTION

According to 1:63,360 scale mapping by Jolliffe (1946), the property is entirely underlain by metasediments of the Burwash Formation (Henderson, 1985). Rocks in the west half of the claim group have been metamorphosed to greenschist facies and consist mainly of greywacke and argillite. Rocks to the east have been metamorphosed to amphibolite facies and comprise cordierite-rich metasediments derived from greywacke and argillite. The cordierite isograd wanders northerly through the center of the claims. Beds generally strike north-northwesterly and are overturned to the east throughout the western two-thirds of the property. Dips vary from 45° to vertical, but are on average about 65°. The eastern third of the property is transected by the northerly trending Ptarmigan Fault. Dips to the east of the fault are generally moderate (25°-40°) to the west, and the beds are not overturned. Immediately north of the property, on either side of the Ptarmigan Fault, a number of major west-northwesterly trending auriferous quartz veins cut the metasediments. Ptarmigan Mine, now controlled by Cominco, exploited these quartz veins in 1941-42, producing about 360 kg of gold. Further to the north, again adjacent to the Ptarmigan Fault, development work is currently in progress on a number of auriferous crosscutting quartz veins lying on Treminco Resources Limited's TOM claims.

CURRENT WORK AND RESULTS

One geologist spent 27 days evaluating the gold potential of the TREM group by prospecting, mapping and sampling. Geological data were recorded on 1:4800 scale topographic base maps prepared by the McElhanney Group Ltd. of Vancouver. Fifty-nine rock-chip samples collected from areas of interest were analyzed for 30 elements and assayed for gold. Only two of the rock-chip samples returned significant gold assays (22.9 ppm and 12.48 ppm Au), but both of these were from the Ptarmigan property. The multi-element analyses did not yield reliable geochemical suites that might be indicative of gold-bearing formations or structures.

PRO CLAIMS

Laurence B. Halferdahl, for	Gold
Prosperous Syndicate	85 J/9
18, 10509-81 Ave.	62°34′N, 114°15′W
Edmonton, Alta., T6E 1X7	

REFERENCES

Baragar (1961); Helmstaedt and others (1980); Henderson (1985): Jolliffe (1938); Lord (1941, 1951); McGlynn (1971).
DIAND assessment reports: 081835, 082040.

PROPERTY

PRO 3-8 (2864 ha).

LOCATION

The claims are between Walsh Lake and Prosperous Lake within 20 km of Yellowknife. Access is by boat from Yellowknife to Prosperous Lake via the Yellowknife River, or by road to Vee Lake and boat to Walsh Lake.

HISTORY

The claims are in the Yellowknife area, which has been extensively explored, mainly for gold, since the early thirties when ore deposits were found at Yellowknife. The history

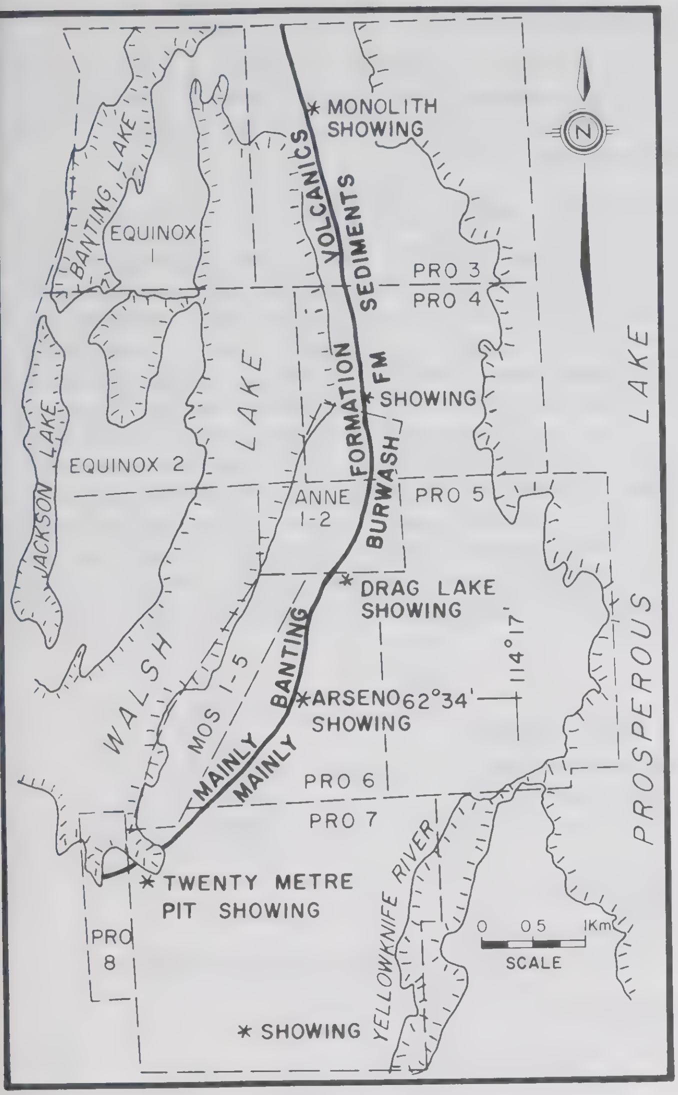


FIGURE 8-56: Gold showings on the PRO claims (geological contact taken from Helmstaedt and others, 1980).

of exploration in the claims area is too complex to summarize completely in this forum. Past exploration is more fully described by Baragar (1961), Jolliffe (1938), Lord (1941, 1951), and McGlynn (1971).

The most extensive gossan on the property, situated in the northwest corner of PRO 7 (Fig. 8-56), was initially staked as the BELL-MURPHY group in 1928. It was restaked as the LEN group in 1957 and a shallow trench excavated by the previous owners, now known as the Twenty Metre Pit, was deepened to 2.4 m. Four samples collected by Baragar (1961) yielded assays of trace to 0.17 ppm Au. Noranda restaked the gossan in 1977 as the LAW claims. These later lapsed. PRO 3-7 were recorded in May of 1983 and PRO 8 was added in August, 1984.

DESCRIPTION

The claims are underlain by an arcuate but northerly trending, east-facing, steeply dipping succession of metavolcanics and metasediments of the Archean Yellowknife Supergroup. They cover (Fig. 8-56) felsic to intermediate volcanic rocks of the Upper Banting Formation and extend easterly into the metaturbidites of the overlying Burwash Formation (Henderson, 1985). Considerable amounts of sulphides were noted by Helmstaedt and others (1980) along the volcanic-sedimentary contact, which is marked by interbedded volcanics and argillite. The volcanics contain some fine-grained iron sulphides.

CURRENT WORK AND RESULTS

1984 Work

In 1984, parts of the property were mapped at approximately 1:9000. In general, the map is in agreement with that of Helmstaedt and others (1980). Three showings, the Twenty Metre Pit, Arseno and Monolith showings (Fig. 8-56), were mapped in detail and sampled. Samples were also collected from the Drag Lake showing and two other unnamed showings on the property (Fig. 8-56). A total of 96 rock samples from sulphide-rich zones were analyzed for gold, copper, lead, zinc, molybdenum, arsenic and tin. Twenty-five samples of various lithologies were petrographically described. The main conclusions stemming from this work are:

1) Gold concentrations significantly above the crustal abundance of 4 ppb are present at several places within the property.

2) The highest gold concentration, 5.6 g/t across 5 m, is from the Arseno showing on PRO 6 about 1 km east of Walsh Lake. This interval includes a quartz vein carrying large amounts of arsenopyrite with 3.7 g/t gold.

3) The largest concentration of sulphides encountered in 1984 is at the Twenty Metre Pit showing on claim PRO 7 at the southeast end of Walsh Lake, where several metres of almost massive pyrrhotite and minor associated chalcopyrite are present just above the contact of the Upper Banting Formation with the overlying Burwash Formation. The structure consists of steeply plunging folds with the showing at the northern end of a linear drift-covered depression, which marks a fault. The highest gold concentration is 73 ppb, much below an economic grade.

1985 Work

In 1985, part of PRO 7, including the Twenty Metre Pit showing, was mapped at 1:2000. Parts of PRO 4, 5, 6 ,7 and 8 were mapped at 1:4000. The Drag Lake Showing was mapped at 1:1000. Additional work included lake sediment sampling, biogeochemical sampling, chip sampling, overburden drilling and the drilling of one Winkie hole.

The geological investigations confirmed that the contact between the Upper Banting Formation and the Burwash Formation, which varies from abrupt to gradational, is characterized by the presence of massive to bedded or vuggy pyrite-pyrrhotite in a zone up to 15 m thick. Disseminated pyrite-pyrrhotite extends further down into the Upper Banting Formation and for 5 to 20 m up into the Burwash Formation metasediments.

The Burwash Formation metasediments are disharmonically folded over the more competent metavolcanics of the Upper Banting Formation. Structures in the metasediments are complex and difficult to resolve because of the absence of marker beds. However, the metasediments generally face east between Prosperous and Walsh lakes, and there is no evidence of the existence of the Yellowknife Syncline postulated by Henderson (1985) in this area.

A total of 31 rock-chip samples were collected from areas of interest and analyzed for gold, copper, lead, zinc and arsenic.

In a biogeochemical survey, thirty-six samples of Labrador Tea were collected at 10-m intervals along six lines ranging in length between 32 m and 90 m. Samples were analyzed for copper, lead, zinc, arsenic and gold.

Sixty sediment samples were collected, mainly from small lakes, and analyzed for gold, copper, lead, iron and manganese. An attempt was made to sample basal overburden using a Stihl 4308 powerhead and JKS augers. However, progress through permafrost was too slow and only one sample was retrieved.

One 8 m long Winkie hole was drilled in a covered area immediately east of the Twenty Metre Pit Showing. Only sparse sulphides were encountered.

EQUINOX, TING, WAL CLAIMS

Walter J. Humphries	Gold
P.O. Box 1856	85 J/9
Yellowknife, NWT, X1A 2P4	62º37'N, 114º17'W

REFERENCES

Baragar (1961); Helmstaedt and others (1980); Henderson (1985); Jolliffe (1938); Lord (1941, 1951); McGlynn (1971).
DIAND assessment reports: 017330, 017373, 017422, 061422, 080251, 080741, 081393, 081897.

PROPERTY

EQUINOX 1-2 (962 ha)
TING 1-2 (544 ha)
4 WAL claims (66 ha)

LOCATION

The claims are 16 to 24 km north of Yellowknife and cover Banting Lake as well as the northern half of Jackson Lake and Walsh Lake. Access is by float plane to any of these lakes, or by road to Vee Lake and thence by boat to the property.

HISTORY

The claims are in the Yellowknife area, which has been extensively explored, mainly for gold, since the early thirties when ore deposits were found at Yellowknife. Banting Lake is named after Dr. Banting (co-discoverer of insulin) and Jackson Lake after Group-of-Seven artist, A.Y. Jackson. Banting and Jackson were members of a field party that participated in this early exploration. The history of exploration in the claims area is too complex to summarize completely in this forum. Past exploration is more fully described by Baragar (1961), Jolliffe (1938), Lord (1941, 1951), McGlynn (1971), and in the various DIAND assessment reports listed above under REFERENCES. Parts of the present claims were previously held as the NIB, DOT, LEE, SAMEX and JW groups.

The WAL 1-15 claims were recorded by W.J. Humphries in 1974. Most of these lapsed, but four were taken to lease in 1984. The TING and EQUINOX claims were recorded in 1983.

DESCRIPTION

The claims are underlain by a northerly trending, steeply dipping succession of Archean Yellowknife Supergroup metavolcanics and metasediments (Fig. 8-57), (after Helmstaedt and others, 1980).

CURRENT WORK AND RESULTS

Work done in 1985 included reconnaissance prospecting and detailed mapping and sampling of the various showings (Fig. 8-57) previously discovered on the claims. Most of the showings consist of sulphide- and/or quartz-bearing auriferous shears. Pop-hole trenching (10 pops) was done on the Sam Otto, Samex and Mispickle showings. One hundred samples were collected and analyzed for gold. Soil samples collected along several topofil traverses were analyzed for gold. A trail was cut from a boat-landing site on Banting Lake to the Nib North showing. About 2200 m of line were cut on TING 1 parallel to the Nib North zone, and about 150 m on EQUINOX 1 to re-establish an old baseline. The resulting highlights of this work are summarized in Figure 8-57.

VAD CLAIMS

Lawrence Mining Corporation	Gold
6508 East Blvd.	85 O/1
Vancouver, B.C., V6P 5P9	63º04'N, 114º13'W

REFERENCES

Tremblay (1952).
DIAND assessment reports: 080256, 081976.

PROPERTY

VAD claim (20.9 ha).

LOCATION

The claim is 65 km north-northeast of Yellowknife.

HISTORY

It is reported (DIAND assessment report 081976) that 5 trenches were excavated on the property in 1965, and that assays ranging from 2.0 to 58.0 ppm Au were obtained from trench samples. The area was staked as GOD 1 and explored by Nemco Exploration Ltd. in 1974. Eighteen samples collected from quartz veins in diorite were assayed; the best result being 13.7 ppm Au across a 20 cm wide vein (DIAND assessment report 080256). VAD was recorded in 1980 and transferred to Lawrence Mining Corporation in 1982.

DESCRIPTION

The claim is underlain by diorite flanked by Archean metasediments (greywacke, argillite) of the Yellowknife Supergroup (Tremblay, 1952). Mineralized quartz veins intrude the diorite in a restricted area north of Goodwin Lake. The veins form a stockwork comprising less than 5% of rock volume and exhibiting no preferred orientation. They are generally narrow, discontinuous and only sporadically mineralized with

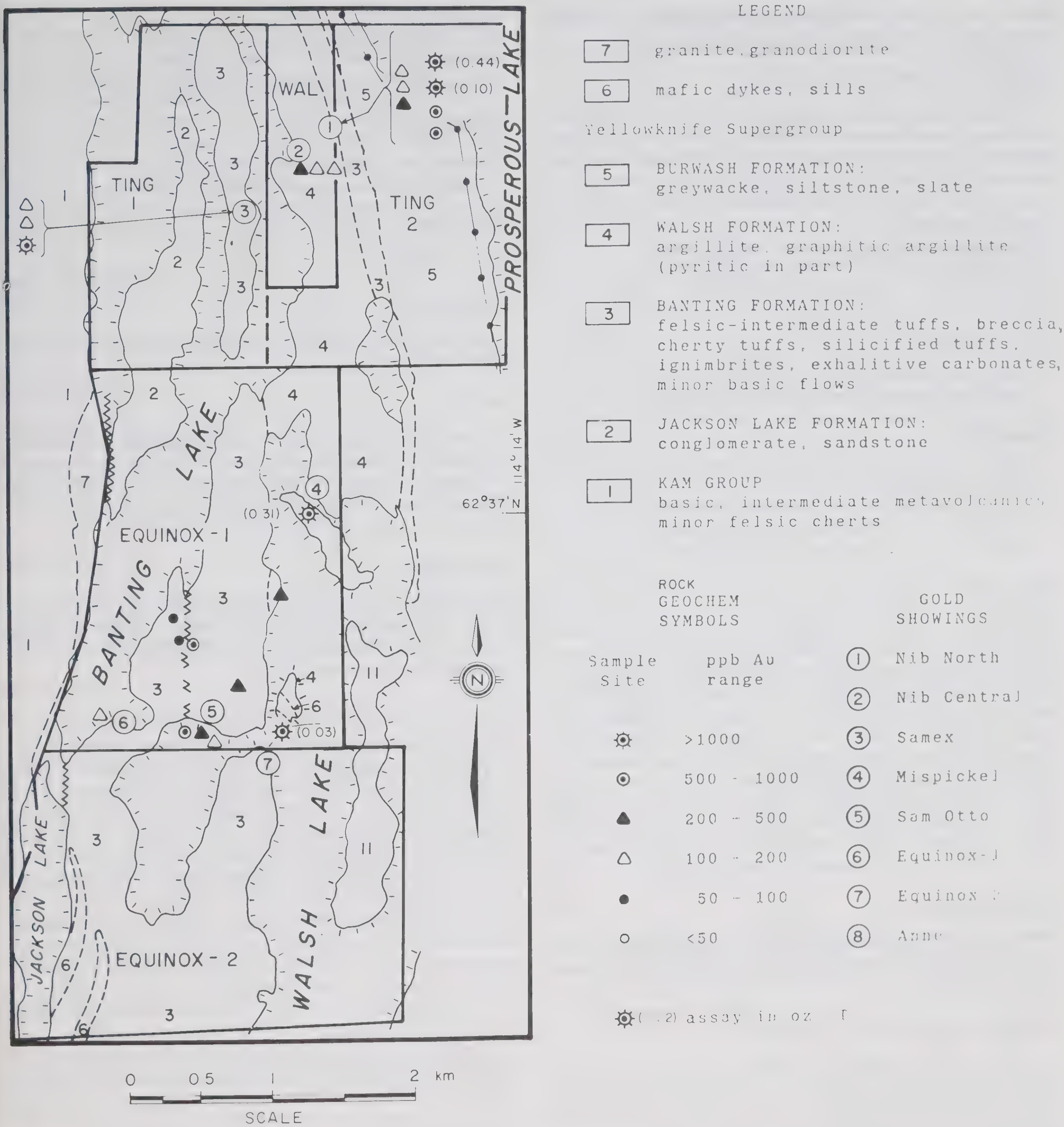


FIGURE 8-57: Geology of the TING, WAL and EQUINOX claims and prospecting highlights.

pyrite, arsenopyrite, chalcopyrite, sphalerite and galena. Gold appears to be associated with sulphide-rich zones.

CURRENT WORK AND RESULTS

In 1985, the quartz-veined zone was blasted and sampled to make a general assessment of the economic potential. No assays were reported. No further work was recommended in view of the small volume of quartz-vein material.

JIM CLAIMS

Lawrence Mining Corp. Ltd.	Copper, Zinc
6508 East Blvd.	85 P/6,7
Vancouver, B.C., V6P 5P9	63°22.5'N, 113°W

REFERENCES

Moore and others (1951).
DIAND assessment reports: 060048, 081940.

PROPERTY

JIM 1-2 (209 ha).

LOCATION

The claims are 120 km north-northwest of Yellowknife.

HISTORY

The main showing on the claims, an exposure of massive sulphides comprising pyrrhotite, pyrite, chalcopyrite and sphalerite, was staked and trenched by Mr. G. McLeod in 1956. Various owners restaked the ground during the sixties and seventies, but no work was reported. A portion of a regional airborne input survey by Great Plains Petroleum covered the claims in the seventies (DIAND assessment report 060048). This survey outlined a strong north-northwesterly trending conductor coinciding with the main showing. The JIM claims, which cover this conductor, were recorded by Mr. J.W. Essery in 1981. The property was transferred to Lawrence Mining Corporation in March of 1982.

DESCRIPTION

The claims are underlain by Yellowknife Supergroup mafic metavolcanics and a small granitic to granodioritic intrusion (Moore and others, 1951).

CURRENT WORK AND RESULTS

Work in 1985 consisted of a one-day visit to the property by two geologists and a prospector to assess the main showing and to determine the nature of the conductor associated with it. The conductor corresponds to a zone of massive sulphides that was traced on the ground for about 1500 m. Five pits were excavated into the massive sulphides approximately 0.80 km north-northwest of the main showing. The pits expose a 9 m wide zone varying from massive sulphides to silicified metavolcanics carrying finely disemmiated sulphides. Country rocks are schistose andesites that are commonly silicified near the massive sulphides. The best assays from four grab samples were as follows: 0.08% Cu, 0.15% Zn, 0.17 ppm Au and 2.57 ppm Ag.

KA CLAIMS

Giant Yellowknife Mines Ltd.	Gold
Box 2000	85 P/8
Yellowknife, NWT, X1A 2M2	63°17'N, 112°12'W

REFERENCES

Moore and others (1951).
DIAND assessment report: 081888.

PROPERTY

KA 1 (627 ha).

LOCATION

The claim is south of Beniah Lake, about 140 km northeast of Yellowknife.

HISTORY

There are trenches and pits on the property that date from the mid forties, but there are no signs of drilling and no record of geophysical surveys. The KA claim was recorded for Mr. William Kizan in August of 1983 and transferred to Giant Yellowknife Mines Ltd. in May, 1985.

DESCRIPTION

The claim, which is included in 1:253,440 mapping by Moore and others (1951), is underlain mainly by mafic metavolcanics (Yellowknife Supergroup) forming part of the Beaulieu River Greenstone Belt.

CURRENT WORK AND RESULTS

In 1985, the western portion of the claim near Bridge Lake (Fig. 8-58) was mapped at 1:10,000 and the remainder of the claim in less detail. Three northerly trending volcanic units were recognized: 1) massive mafic intrusions and flows; 2) pillowed flows; and 3) banded chloritic schists. The pillowed flows occasionally include pillow breccia, and tuffaceous units 1 to 3 m thick are occasionally found in the massive and pillowed flows.

A total of 100 samples were assayed to assess showings exposed in previously completed trenches and to test newly discovered zones. Three types of gold-bearing formations were encountered: 1) late-stage quartz veins, 2) sulphide-rich tuffs and concordant quartz veins and 3) narrow, finely banded arsenopyrite-rich bodies within mafic units.

Samples from late-stage quartz veins assayed less than 3.4 ppm Au. Sulphide-rich tuffs associated with quartz lenses and chert contained a maximum of 31.2 ppm Au, but this encouraging assay was from a thin (10 cm) tuff band that was found to be relatively unmineralized elsewhere (0.34 ppm Au in another sample collected 3 m along strike). Significant assays from other thin sulphide-rich tuff units include: 12.68 ppm Au in a chip sample across 30 cm; 5.5 ppm Au in a grab sample of pyritic quartz and siliceous country rock, and 16.8 ppm Au in a grab sample from a 2 to 3 cm wide band of grey siliceous tuff. All of these results were obtained from samples collected from trenches east of Bridge Lake. In the vicinity of Top Lake, an arsenopyrite-rich tuff unit was identified that assayed 17.83 ppm gold across 35 cm. Sul-

phides associated with the auriferous tuffs are pyrite and arsenopyrite. Encouraging results were also obtained from sampling of trenches in the northwest part of the property. The trenches expose a siliceous, arsenopyrite-bearing unit hosted in mafic volcanic rocks. It is first noted as thin (1 to 2 cm) veinlets of arsenopyrite, pyrite and quartz in mafic volcanics, but swells along strike (345°/58°E) to a maximum of 40 cm before dwindling into another series of thin veinlets. Significant assay results were obtained from this unit, including 39.77 ppm Au across 35 cm. The auriferous unit has been traced in trenches for a strike length of about 25 m.

KAT CLAIMS

Giant Yellowknife Mines Ltd	Gold
Box 2000	85 P/8
Yellowknife, NWT, X1A 2M2	63°19'N, 112°20'W

REFERENCES

Moore and others (1951).
DIAND assessment reports: 019652, 081888.

PROPERTY

KAT 1-3, 5 (2509 ha).

LOCATION

The claims are in three separate blocks (Fig. 8-58) and are east and west of the southeast arm of Beniah Lake, about 140 km northeast of Yellowknife.

HISTORY

The area has been prospected since the mid forties, with work concentrated on rusty shear zones in volcanics and on gossans associated with sulphide-rich exhalites. In 1970-1971, Shield Resources conducted airborne EM and magnetometer surveys over the area and followed up on the resulting anomalies by staking, linecutting, geophysical surveying, mapping and drilling (DIAND assessment report 019652). Base- and precious-metal indications from the zones tested were not encouraging, and the various claim blocks were allowed to lapse. The KAT claims were recorded by L. Covello and M. Senkiw in May of 1984 and transferred to Giant Yellowknife Mines Ltd. in August, 1985.

DESCRIPTION

The claims, which are included in 1:253,400 mapping by Moore and others (1951), are underlain mainly by mafic metavolcanics (Yellowknife Supergroup) forming part of the Beaulieu River Greenstone Belt.

CURRENT WORK AND RESULTS

The claims were staked to cover EM anomalies and sulphide showings reported from previous work. Gold in the Courageous Lake - Mackay Lake greenstone belt to the east (see to Chapter 2, Salmita Mine) is associated with late-stage felsic volcanics at the top of a mafic volcanic sequence. The purpose of exploration in 1984 was to search for equivalent stratigraphy on the KAT claims and to sample carbonate alteration zones, disseminated and massive sulphides, and quartz veins within the volcanic pile. The claims were mapped at 1:10,000 and areas underlain by felsic volcanics and felsic sub-volcanic intrusions were identified. Siliceous exhalites (chert, flow-banded rhyolite and felsic tuff) were recognized at the top of a volcanic cycle in both the eastern and western claims. In the W-Zone, a zone of intense silicification 1 km north of Rhyolite Lake (Fig. 8-58), greywacke and argillite deposited on bedded chert are overlain by a younger sequence of mafic flows. A total of 160 grab samples were collected from the claims for assay. Most of these were samples of carbonate alteration zones and felsic volcanic rocks. All assays were less than 1.0 ppm Au, and the majority of the samples contained only trace amounts of gold. Most silver assays were correspondingly low, although samples from the Rhyolite Lake area returned up to 63 ppm Ag.

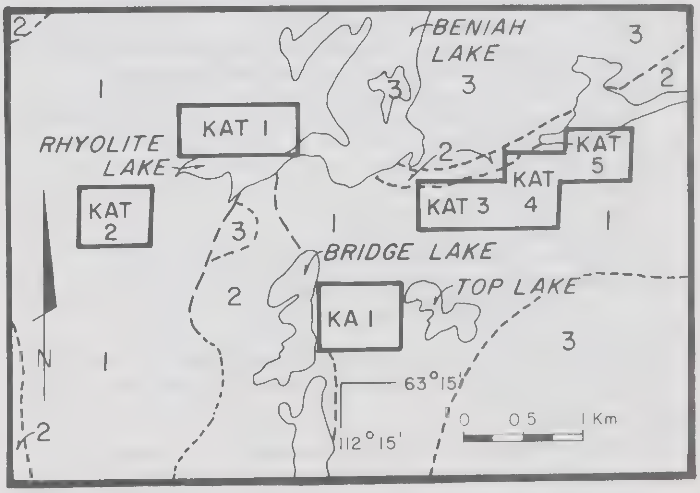


FIGURE 8-58: *Geology of the KAT and KA claims, Bridge Lake area (geology from Moore and others, 1951).*

REFERENCES

Allan, R.J. and Cameron, E.M., 1973:
Uranium, zinc, lead, manganese, iron, organic matter, copper, nickel and potassium content of lake sediments, Bear-Slave Operation, District of Mackenzie; Geological Survey of Canada maps 9-1972 to 15-1972.

Allan, R.J., Cameron, E.M. and Durham, C.C., 1973a:
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Affaires indiennes et du Nord Canada

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Northwest Territories

Canada

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CHAPTER 1
INTRODUCTION

W.A. Padgham
Chief Geologist

Mineral Industry Reports (MIR) for the Northwest Territories have been produced by the NWT Geology Division of Indian and Northern Affairs since DIAND assumed full responsibility for territorial mineral resources in 1969. This, the 16th volume in the MIR series, describes mining and documents mineral exploration in 1986 and 1987. Property write-ups were prepared by NWT Geology Division staff from information obtained from assessment reports which are held in the Geology Archives, augmented by personal observations. All assessment reports are indexed in the GEOSCAN data base, a system that contains bibliographic information on most government geological reports and reports reporting on exploration for oil and gas on Canada lands in NWT. The document number listed under references for each write-up can be used to access the assessment report in the Geology Archives and to order microfiche copies of the report.

NWT GEOLOGY DIVISION FUNCTIONS AND ACTIVITIES

The NWT Region of the Northern Affairs Program of DIAND is responsible for the administration of all mineral resources in the NWT, excluding oil and gas. The Geology Division, under this authority, acts much as a Provincial Geological Survey. Oil and gas resources are administered by COGLA (Canada Oil and Gas Land Administration). Transfer of this responsibility to the NWT Government is now being negotiated.

To fulfil its mandate, the NWT Geology Division:

1. Maintains a geological data base to assist in the furtherance of mineral exploration and development.
2. Monitors mining and mineral exploration, provides drilling authorities and monitors diamond drilling as required by the Canada Mining Regulations.
3. Reviews technical assessment work submitted to the Mining Lands Division.
4. Provides advice and assistance to individuals or organizations interested in NWT mineral resources and geology.
5. Expands geological knowledge of the NWT, its mineral deposits and mineral potential.

In 1986 the division budget to pursue these goals was approximately $1.3 million, made up of: salaries $703,000, for 12 permanent employees; capital $135,000; operating funds $600,000; and minor funds received under special programs for summer student employment. The 1987 budget was essentially the same.

SUMMARY OF MINING

Eight mines operated in the Northwest Territories in 1986 and 1987. Mine and metal production figures are given in Chapter 2. Although three mines closed, there are proposals to bring a number of gold properties to production by 1990.

Continued low prices of mineral commodities, other than gold and platinoids, adversely affected many areas of the NWT mineral economy. Gold and PGE exploration and development expanded significantly, while uranium and base metal exploration declined precipitously.

Pine Point Mines Ltd. announced plans to cease mining by the end of 1987. Higher grade material was processed in an attempt to maintain profitability. Mining ceased at Pine Point at the end of June 1987 and the mill and town of Pine Point were dismantled in 1988.

Tungsten production at Cantung Mine ceased on May 20, 1986 because of a labour dispute. On August 12, 1986 Cantung closed, primarily because of steadily decreasing tungsten prices. The mine, mill and town of Tungsten were mothballed in anticipation of future reopening but at the time of writing (March 1989) tungsten prices were still too low to allow production to resume.

In spite of low lead and zinc prices Nanisivik performed well, and with high prices in 1988-89 the mine life should be extended well beyond its originally projected 12 years. The Federal Government sold its 18% equity interest in Nanisivik Mines Ltd. to Mineral Resources International in 1986.

Cominco Ltd. was sold by Canadian Pacific Ltd. to a consortium comprising Teck Corp. of Vancouver, Metallgesellschaft (Canada) Ltd. and MIM (Canada) Ltd., both of Toronto, and the Con Mine was sold by Cominco Ltd. to NERCO-Con Minerals of Alaska in December 1986.

NERCO-Con increased exploration considerably in areas of the mine that have been out of production for many years.

Pamour Porcupine purchased the Falconbridge interest in Giant Yellowknife Mines. Production in 1986 at Giant Mine was from the open pits and the UBC and GKP zones. In 1987 production was from ASD, GB, UBC and from three open pits. A ramp was driven from surface to the 1200-foot level.

Ore from Treminco Resources Ltd.'s Tom Mine was processed at the Giant Yellowknife mill in 1987. Ptarmigan Mine was acquired by Treminco from Cominco Ltd. and was being developed for production which began in 1988. A decline to the 250-foot level was completed in November.

Mining ceased at Salamita Mine in mid-February 1987 and the mine was allowed to flood. Milling continued until the end of April. Giant Bay Resources treated 330 t of tailings from Giant's RED 24 claim in a bio-tank-leach pilot plant. This circuit increased gold recovery from the refractory ore to over 95.6%, compared with 65% using conventional milling. A 9.67 kg dore bar was produced.

Development at Lupin Mine in 1986 confirmed the extension of the centre zone to a depth of 650 m. In 1987 a new hoist, capable of operating to 1200 m, was installed. The cut-off grade was lowered to 10.5 g/t from 11.1 g/t Au early in the year and tonnage increased to 1727 t/day from 1600 t/day.

In December 1987, Neptune Resources announced plans to bring the Colomac property to production.

SUMMARY OF MINERAL EXPLORATION

The level of exploration for gold, base metals and uranium in 1986 was comparable to that of 1985. Expenditures for mineral exploration were in the range of $50 million on at least 130 properties.

Exploration expenditures almost doubled in 1987 to $90 million spent on at least 117 properties, 63 of which were diamond drilled. The expenditures in 1987 were determined by an NWT Chamber of Mines telephone survey and appear to be the most accurate and complete figure compiled for any year so far.

The focus of mineral exploration has shifted significantly in the past eight years. In 1980 more than half the properties explored had only uranium potential and base metals were a more preferred target than gold (Table 1-1). Since then, gold has been the predominant target and exploration for silver, base metals and uranium has declined to insignificance.

PLATINUM, URANIUM, BASE METALS, SILVER, BERYLLIUM

There was an increase in the number of platinum exploration projects but a decline in the number of rare metal exploration projects.

Staking of ultramafic rocks for platinum group elements (PGE) provided a new thrust in exploration. Claims now cover: the Muskox Intrusion, where diamond drilling was conducted in 1986 and 1987; the Duck Lake sill, east of Yellowknife; the Rankin Inlet copper-nickel deposit; and areas adjacent to Canico's Ferguson Lake nickel-copper deposit in south-central Keewatin. Drilling on copper-nickel showings, found a few years ago near Rutledge Lake, was probably encouraged by the PGE potential of those showings.

Interest in PGE continued in 1987 and by the end of the year most ultramafic rocks identified in the NWT had been staked.

Urangesellschaft, PNC (Power Nuclear Corporation of Tokyo) and CEGB (Central Electric Generating Board) continue to explore for uranium. Total expenditures were close to $5 million in 1986 but only $3.5 million in 1987.

Base metal exploration was mainly confined to areas adjacent to or within producing mines: Pine Point, Polaris and Nanisivik. Expenditures on base metal exploration declined to about $3.5 million in 1987 from about $5 million in 1986.

Silver-base metal exploration expenditures increased following the discovery of a volcanogenic silver-base metal deposit by Aber/Hemisphere joint venture in fall 1987. The Sunrise Lake deposit is near Sunset Lake on the Beaulieu River 85 km east-northeast of Yellowknife.

Procan Resources gained control of the Prairie Creek (Cadillac) silver-base metal deposits, but this operation is not likely to start up until metal prices improve.

Highwood Resources and Hecla Mining joined forces in 1986 to develop the Thor Lake beryllium-rare earth deposits.

GOLD EXPLORATION

Gold was the bright spot in mining and exploration as gold price rises during 1986 sparked higher interest in the yellow metal.

In 1986 the Bullmoose, Tom and Giant Bay gold properties were explored underground. Drilling continued on Echo Bay's Indin Lake deposits (Lex and Cass) and on Noranda/Getty's Tundra Project. Canuc Resources continued to drill on their Coronation Gulf property. Aber Resources obtained good grades and widths in drilling on the BUGOW property, which is just north of Fort Rae.

Cominco, Back River Joint Venture, Bow Valley and many junior companies, including Silver Hart and Welcome North, explored for iron formation-hosted gold deposits in the extensive turbidite domains of the central and northeastern Slave Province. BHP-Utah Mines worked in many parts of the Slave.

The gold search also intensified in the Keewatin, where Asamera, Borealis and Comaplex were active.

Expenditures on gold exploration in the NWT probably exceeded $25 million during 1986; more than 80% of this was in the Slave Structural Province.

In 1987 gold was again the main exploration target, with about $80 million spent on the search for this commodity. Many of the properties explored in 1986 were worked again in 1987.

Gold exploration expanded in the Slave where more than $50 million was spent in 1987. Expansion was even more dramatic in the Keewatin where expenditures on gold exploration more than doubled from 1986 to nearly $20 million in 1987.

In the Keewatin, work was concentrated in the 350 km long Rankin-Ennadai greenstone belt. Borealis Exploration Limited explored the Fat Lake Zone from underground and extracted and milled a 3000 t bulk sample. Noble Peak Resources, Sunmist Energy, Canadian Nickel Company and Homestake Development diamond drilled some of their properties, and smaller grassroots programs were done by at least three other companies.

TABLE 1-1: EXPLORATION PROJECTS BY TARGET COMMODITY

COMMODITY	AGE OF MAIN HOST ROCKS (GEOLOGICAL PROVINCE)	1981	1982	1983	1984	1985	1986	1987
Gold	ARCHEAN (Slave & Kaminak Subprov.); placer in Nahanni	48	25	53	78	95	105	102
Uranium	PROTEROZOIC (Bear & Churchill)	104	36	26	16	8	6	3
Silver	PROTEROZOIC (Bear)	8	3	9	3	4	0	0
Base Metals	all ages (+ Ag in Slave)	37	30	19	15	10	9	3
Rare Metals	ARCHEAN/PROTEROZOIC/CRETACEOUS (Slave-Bear-Cordillera)	12	15	7	3	15	9	9
Coal	CRETACEOUS/TERTIARY	0	2	1	1	0	0	0
MISCELLANEOUS		9	2	1	1	7	1	0
TOTALS:		**218**	**113**	**116**	**117**	**139**	**130**	**117**

The following describes the more important Slave Province projects done in 1987. In the Courageous Lake area, Getty Resources and Noranda Exploration spent more than $8 million drilling to outline the Fat Zone, which is hosted in sheared felsic volcaniclastics. Results of deep drilling (>500 m) were as encouraging as those of shallower drilling (150 m) which outlined reserves of about 1.25 Mt grading 9 ppm Au. In a press release issued in late December, Getty Resources estimated possible geological reserves at the Tundra project to be 8.4 Mt grading 8.9 g/t Au. An underground exploration program underway in 1988-89 is expected to cost more than $30 million.

In the Indin Lake area, Neptune Resources spent more than $7 million to vat leach low-grade gold-bearing rock from the Colomac Dyke, a quartz-albite intrusion. The Colomac Dyke includes one zone containing 13 Mt grading 1.5 ppm Au, as well as five other zones of somewhat smaller size but similar grade. In December, Neptune Resources announced their intention of bringing the Colomac property to production by the early 1990's.

In the Indin Lake area projects were underway by joint ventures comprising Echo Bay Mines Limited/Petromet Resources/Comaplex, and Mahogany Resources/Treasure Island Resources. The Echo Bay joint venture outlined two deposits, the Kim Zone, in mafic flows and Cass Zone, in a gabbro sill.

In the Contwoyto Lake area, Cominco obtained encouraging results from three holes drilled in iron formation on ground about 30 km southeast of Lupin Mine. Each hole intersected 3 to 4 m grading 12 to 40 ppm Au.

In the Yellowknife area, Treminco Resources spent about $3 million to rehabilitate the Ptarmigan Mine, a turbidite-hosted quartz-vein deposit with proven reserves of 150 kt grading 10 to 11 ppm Au. Three other turbidite-hosted quartz-vein deposits in the sedimentary basin east of Yellowknife are in the underground exploration stage: the Kidney Pond Zone (Giant Bay Resources); the WT deposit (Westfort Petroleum); and the Lambert Vein (Lightning Minerals).

Giant Yellowknife Mines Limited announced it will spend about $25 million at Yellowknife to construct a plant to treat 6.3 Mt of tailing grading 2.3 ppm Au. This plant was commissioned in the spring of 1988.

In the Russell Lake Basin, northwest of Yellowknife, auriferous iron formations similar to Lupin were evaluated by Aber Resources, Freeport McMoran and others.

EXPLORATION LEVEL INDICATORS

Measuring the level of mineral exploration relative to that of other years is complex. Dollars spent is only one measure; other parameters include the number of properties explored, the number of properties drilled, the amount of core drilled, the area of claims staked and the number of prospecting permits issued. Each criteria provides a measure of exploration and permits comparison of one year's activities with those of other years.

EXPENDITURE ON EXPLORATION

Exploration expenditure is the most difficult parameter to estimate. Figures on what has actually been spent on the ground are difficult to determine when reported amounts include overhead and head office expenditures or property acquisition costs (option payments).

Figure 1-1 shows expenditures estimated for various years. A record high was reached in 1987 with similar expenditures expected in 1988. Flow-through share financing was an important source of funds for this surge, but the success of gold mining, particularly at Echo Bay's Lupin mine, and the discovery of the Noranda/Getty (now Noranda/TOTAL Energold) Tundra property have also contributed.

PROPERTY ACQUISITION

In 1986, 358 829 ha were staked, a 5-year record high and an increase of 64% relative to 1985 (Table 1-2). About 80% of the ground staked is in the Mackenzie District (mainly in the Slave Structural Province) and about 20% is in the Keewatin District, Rae and Hearne Provinces. The principal target in both areas is gold. No claims were staked in the Cordilleran (Nahanni District) and few were staked in the other mining districts of the NWT. Table 1-2 compares 1986 and 1987 staking to that in other years.

In 1987 a minor staking boom took place in areas of gold potential, mainly in the Slave Structural Province (Table 1-2). Over 372 397 ha (600 claims) were staked in the Slave, and 88 919 ha (108 claims) in the Keewatin.

Staking for volcanogenic silver and lead-zinc took place in the Sunset-Beaulieu River volcanic belt, and in the Bear Province (along the Fault River) for the platinum potential of long-known uranium showings.

In spite of increased staking (552 000 ha were staked in 1987), total area of claims in good standing in the NWT increased only slightly as 430 656 ha of claims lapsed.

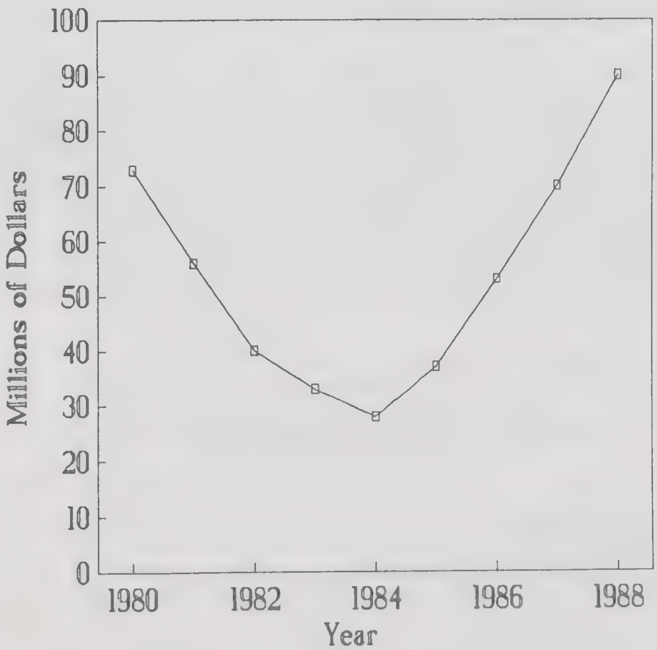

FIGURE 1-1: *Graph showing exploration expenditures for the years 1980 to 1988.*

TABLE 1-2: AREA STAKED IN HECTARES IN THE VARIOUS GEOLOGICAL TERRANES OF THE NWT 1976-1987

DISTRICT	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
Arctic Islands	0.9	1.4	82.1	16.0	9.7	3.0	22.8	4.0	29.4	0.5	1.0	0.0
Keewatin[1]	214.0	108.0	620.0	438.8	518.1	323.2	65.0	52.6	25.0	49.9	71.9	88.9
SE Mackenzie[1]	30.4	78.7	314.0	322.1	175.5	82.5	18.4	31.3	12.5	8.7	1.0	21.9
Slave Province	62.2	67.8	53.9	35.6	51.0	153.3	20.7	218.5	161.2	231.3	209.5	372.4
East Arm[2]	1.5	2.1	2.6	11.1	0.02	11.2	0.1	-	-	0.1	5.7	0.6
Bear Province	45.0	170.0	84.6	171.8	40.0	21.0	6.7	13.3	0.2	1.2	67.2	67.1
Pine Point[3]	49.2	5.6	255.3	131.9	13.5	2.5	0.7	0.1	10.4	-	2.5	0.2
Cordillera	8.2	19.9	19.0	14.4	25.2	12.9	25.0	11.6	2.2	1.8	-	0.8
TOTALS:	**411.4**	**453.5**	**1431.5**	**1141.7**	**833.02**	**609.6**	**159.4**	**331.4**	**240.9**	**293.5**	**358.8**	**551.9**

[1] Churchill Province
[2] Bear Province
[3] Interior Platform

CLAIMS IN GOOD STANDING

Under the present Canada Mining Regulations, mineral claims can contain from one to fifty 20 ha units. One unit is 1500 feet (approximately 500 m) square. Prior to 1979 only single 1500 foot square claims could be staked. As a result of this change, although fewer claims are now staked each year, much larger areas are covered by each claim.

Most of the single unit claims will soon, or have already lapsed, because claims lapse after 10 years unless they are taken to lease.

Table 1-3 compares claims and areas staked, lapsed and in good standing since 1983. It shows that there has been little net change in the area staked but the number of claims is less than half (41%) of what it was in 1983.

TABLE 1-3: MINERAL CLAIMS IN THE NWT 1983 to 1987

		Claims (Hectares)	
Year	**Recorded**	**Cancelled**	**Good Standing**
1983	547 (330,592)	424 (703,289)	40,952 (3,114,606)
1984	488 (240,900)	4,222 (472,323)	36,528 (2,878,225)
1985	461 (294,887)	6,565 (455,237)	30,398 (2,704,790)
1986	531 (360,361)	5,655 (339,468)	25,226 (2,721,985)
1987	843 (552,385)	6,031 (430,657)	20,052 (2,829,403)

PROSPECTING PERMITS

The intent of Prospecting Permits is to encourage exploration in high cost areas which have had little mineral exploration. In the last few years, with the shift of exploration to gold and with its concentration in the Slave and Hearne (SE Churchill) Structural Provinces, fewer prospecting permits have been applied for, and, because of the intensity of exploration interest, fewer applications have been approved.

Table 1-4 shows the changes in number and distribution of prospecting permits over the past 14 years. Figures for 1988 and 1989 are added to show the trend to fewer permits.

Prospecting permits were first issued in the late 1960's and in 1987 the 1115th permit was issued. As can be seen from Table 1-4, permits are far less popular than they were during the last uranium exploration boom.

In 1986, 18 permits were relinquished or expired; in 1987, 45 were relinquished or expired.

TABLE 1-4: PROSPECTING PERMITS ISSUED 1976 TO 1987 IN VARIOUS GEOLOGICAL PROVINCES

AREA	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
Arctic Island	0	0	10	0	10	2	53	87	10	15	0	0	0	3
Cordilleran Province	1	0	5	6	11	9	12	7	0	0	0	1	0	0
Churchill Province	53	25	50	72	57	54	17	1	10	11	29	5	37	18
Bear Province	13	8	10	36	17	4	3	0	0	5	2	0	0	0
Slave Province	1	1	0	0	3	4	6	1	5	22	0	0	8	3
TOTALS:	**68**	**34**	**75**	**114***	**98**	**73**	**91**	**96**	**25**	**53**	**31**	**6**	**45**	**24**

* In previous Mineral Industry Reports only 99 permits were reported issued.

TABLE 1-5: COMPARISON OF ACTIVITY IN VARIOUS GEOLOGICAL PROVINCES AND SUBPROVINCES

GEOLOGICAL REGION	NUMBER OF PROJECTS EACH YEAR 1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
Cordillera	13	14	21	29	24	12	11	11	7	4	2
Arctic Islands [1]	6	8	4	7	24	16	11	17	13	6	1
Keewatin [2]	38	36	48	53	59	34	25	19	17	21	17
SE Mackenzie [3]	11	7	13	14	25	10	11	9	3	1	6
East Arm	2	7	6	4	14	3	1	1	2	1	4
Pine Point	3	7	5	6	6	3	2	1	2	1	1
Bear Province	35	32	32	22	24	10	11	2	3	6	3
Slave Province	28	29	33	29	42	25	44	57	92	90	89
TOTALS:	**136**	**140**	**162**	**164**	**218**	**113**	**116**	**117**	**139**	**130**	**117**

[1] Includes Baffin Island and Melville Peninsula, part of the Churchill Province, as well as the Arctic Archipelago
[2] Churchill Structural Province
[3] Churchill Structural Province in District of Keewatin

TABLE 1-6: HIGH COST PROJECTS (DRILLING, MINE DEVELOPMENT)

	YEAR 78	79	80	81	82	83	84	85	86	87
Drilling	52	61	81	58	45	54	29	35	34	63
Underground Development	2	4	6	12	5	8	4	3	3	2
Mines in Development										5
Producing Mines	7	8	9	11	12	12	11	9	8	8
TOTALS:	**61**	**73**	**96**	**81**	**62**	**74**	**44**	**47**	**45**	**78**

TABLE 1-7: SUMMARY OF DRILLING 1986 & 1987 [1]

BY DISTRICT	1986	1987
Franklin (Arctic Islands)	28,866.5	28,504.0
Keewatin	20,622.8	32,867.5
Mackenzie	108,322.6	128,868.5
BY GEOLOGICAL PROVINCE		
Slave	78,047.9	108,716.8
Bear	1,555.0	3,169.2
Churchill	46,904.3	46,964.5
Cordilleran	--	244.5
Interior Platform	26,660.2	15,348.2
Innuitian	10,044.5	15,797.5
BY COMMODITY		
Uranium	13,443.7	8,664.1
Base Metals	60,526.7	43,852.2
Precious Metals	85,226.9	133,164.7
Tungsten & Rare Metals	1,325.6	--
Platinum Group Elements	2,288.9	4,559.1
SURFACE DRILLING	119,961.5	140,101.1
UNDERGROUND DRILLING	42,850.4	50,138.9
TOTAL DRILLING	**162,811.9**	**190,240.1**

[1] All figures are in metres

PROPERTIES EXPLORED

The number of properties explored is an important measure of activity. Table 1-5 shows the number of properties explored each year since 1975 and their distribution among the geological subdivisions of the NWT.

There was a 10% decrease in the number of properties explored between 1986 and 1987 but a significant increase in total exploration expenditures and a 54% increase in staking. (Properties staked are not included under properties explored in Table 1-5 unless more than prospecting was done on them.)

HIGH COST PROJECTS

A significant increase in expenditures in 1987, partly a result of funds raised in flow-through financing, is reflected in the significant increase in high cost projects over 1984 to 1986 (Table 1-6).

The Canada Mining Regulations require that the Engineer of Mines for drilling be advised prior to the commencement of mineral exploration drilling. Also, the regulations require that a summary report giving the number of holes, the metres drilled and the sites of the holes be provided on a "Form 20". The data provided by industry is a useful exploration parameter. It is compiled in Table 1-7. The data in this table is probably somewhat low because some projects have not been reported.

SUMMARY OF GEOLOGICAL WORK CONDUCTED BY THE NWT GEOLOGY DIVISION

Geology Division staff worked on numerous projects during 1986 and 1987. Many were continuations of multi-year projects.

Open file reports on most of these projects are available from the NWT Geology Division Archives.

1. RUSSELL LAKE 85 J/13, 85 O/4
Project Geologist V.A. Jackson began mapping supracrustals that contain iron formation-hosted gold deposits. The first year of this multi-year detailed mapping project was 1986.

2. HOOD RIVER 76 L
Under the direction of Project Geologist V.A. Jackson, this is a continuation of a long-term project to map the southern extension of the High Lake volcanic belt. In 1986 76 L/10, 15 and 16 were mapped. In 1987 76 L/9, 11, 12 and 13 were mapped.

3. SURFICIAL MAPPING
Glacial deposits in the Russell Lake and Hood River areas and end-glacial marine sediments of the Arctic coast. Paulatuk to Kent Peninsula are being mapped by D. Kerr (now at the University of Alberta) in concert with bedrock mapping by Jackson.

4. HOPE BAY 77 A
Ultramafic sills and basaltic volcanics in the Hope Bay volcanic belt were mapped by W.A. Gibbins, Arctic Islands District Geologist. (This work was continued in association with the Canada-NWT Mineral Development Agreement, beginning in 1988.)

5. OCTOPUS FORMATION 85 J/7, 8
Mapping of south end of Yellowknife volcanic belt was completed in 1986 by K. Pelletier, Carleton University.

6. ELLINGTON LAKE 86 E/11
Mapping of a Bear Province supracrustal, mainly volcanic, belt was completed in 1986 by K. Pelletier, Carleton University. An M.Sc. was completed in 1988.

7. JACKFISH ISLAND 85 J/1, 8
D. Roach, Carleton University, completed in 1987 1:10 000 mapping of the southeastern part of the Yellowknife Bay area, where the southeast end of Yellowknife volcanic belt, Duck and Burwash formations are exposed.

8. CAMERON RIVER VOLCANIC BELT 85 I/15
Detailed (1:10 000) mapping to elucidate structure and stratigraphy of the Fenton Lake and adjacent areas of the Slave Province were conducted by R. Cullen, Carleton University. Field work was completed in 1987, an M.Sc. in 1988.

9. CAMERON RIVER VOLCANIC BELT/SLEEPY DRAGON METAMORPHIC COMPLEX 85 I/15
Structural mapping to determine the relations of volcanics of the Yellowknife Supergroup to the basement complex was conducted by T. Kusky, John Hopkins University, W. Kidd, SUNY, Albany, and C. Isachsen, Washington University, St. Louis. The field work was completed in 1987.

10. POINT LAKE AREA (KESKARRAH BAY) 86 H/7
Structural mapping to determine the relation of Yellowknife Supergroup volcanics to the basement complex was continued in 1986 and 1987 by T. Kusky, John Hopkins University, W. Kidd, SUNY, Albany, and C. Isachsen, Washington University, St. Louis.

11. KAM/BANTING TRANSITION
A study of the transition from the Kam Group to the Banting Group and the relation of the Jackson Lake Formation to these groups was completed by G. Bailey in 1986. An M.Sc. based on this work was completed in 1987 at Queen's University.

12. WESTERN PLUTONIC COMPLEX
Mapping of granitoids along the west side of the Yellowknife volcanic belt to investigate the granite/gold connection was begun in 1986 by D. Atkinson, University of Western Ontario. Field work continued in the summers of 1987 to 1990.

13. NONACHO BASIN
Dr. L. Aspler began, in 1986, 1:50 000 mapping of extensions of the Nonacho Group and collection of material for heavy mineral analysis and gold content. Work was completed in 1987.

14. GOLD VEIN STUDIES, YELLOWKNIFE BASIN
Detailed mapping of gold quartz veins in the Burwash Formation was begun by J.A. Brophy, District Geologist, and W.K. Fyson, University of Ottawa.

15. DEFORMATION STUDIES, YELLOWKNIFE BASIN
Detailed studies to clarify structural relations in the Slave Province were continued by W.K. Fyson, University of Ottawa.

16. DATING BEAR PROVINCE
Geochronological studies in Wopmay Orogen by S.A. Bowring, Washington University, St. Louis, continued in association with Dr. R. Hildebrand, GSC, Ottawa.

17. DATING SLAVE PROVINCE
Geochronological studies in many parts of Slave Structural Province to improve maps and relate the mineral deposits to structural events were conducted by W.A. Padgham, NWT Geology Division, in cooperation with S.A. Bowring and R.I. Thorpe, GSC, Ottawa.

18. MINERALOGICAL STUDIES, THOR LAKE
Mineralogical studies of the Thor Lake rare metal deposits (Lake Zone) were underway by D.W.G. Smith and R. Pinckston, University of Alberta. Field work was completed in 1987.

19. PINE POINT MINES
Geology and mineralogy of N-81 ore body, Pine Point Mines, were under investigation by S. Foster under direction of R.D. Morton, University of Alberta. Field work was completed 1987 and an M.Sc. thesis completed 1988.

20. INGRAHAM TRAIL 85 I, J
District Geologist, J.B. Seaton commenced 1:10 000 geological mapping in the Tibbitt Lake area.

21. BENIAH LAKE 85 P/8
Detailed studies of the volcanic stratigraphy and structure in the Beniah Lake area were begun by D. Roach, University of Ottawa.

22. YELLOWKNIFE BAY FORMATION, LAM GROUP
Studies of sediment-volcanic flow relations in the Yellowknife Bay Formation were begun by H. Falck, J.A. Donaldson, and G. Potts in 1987.

23. PEGMATITE STUDIES
Mineralogical studies of rare element-bearing pegmatites in the Yellowknife Pegmatite Field were continued by P. Cerny and M.A. Weiss, University of Manitoba.

24. GEOCHRONOLOGICAL STUDIES
Geochronological studies in the Slave Province were conducted by C. Isachsen and S. Bowring, Washington U. of St. Louis.

MINERAL DEVELOPMENT AGREEMENT

In 1986 a Canada-NWT Mineral Development Agreement (MDA) was approved. This program is under the umbrella of the general Economic Development Agreement (EDA). Total expenditures under the MDA in the NWT over its life (1987 to 1991) will be $7 million. The Geological Survey of Canada's MDA-Geoscience program will consume $2.85 million and the NWT-Geoscience program will also expend $2.85 million. The remainder of the MDA funds will be spent assisting northern mining operators to improve their operating technology under the Northern Technology Assistance Program (NTAP) ($1 million) and expanding public awareness of the importance

and the economic opportunities in the mining industry through the Northern Mining Information Program (NMIP) ($0.3 million).

Funds available in 1987 for the NWT-operated programs were only $176,000 and money was not available until late in the season. The NWT portion of the 1987 field program was, as a result, rather small scale. It included four contracts to support mainly university-supervised field work as shown in Table 1-8.

SERVICES AVAILABLE FROM THE NWT GEOLOGY DIVISION

The NWT Geology Division of DIAND operates from Yellowknife where the following services are offered to those interested in the geology and non-renewable resources of the NWT.

An Archives and Geological Library contains copies of most federal government documents on the geology of the NWT and many government publications on the mineral industry of the NWT and Canada. A small library of NWT aerial photography is available. A 16 mm cassette system of air photo negatives providing coverage for all of the NWT is also available in the nearby office of the Regional Surveyor (EMR, Canada). The NWT Region Natural Resources Technical Library also maintains a broad spectrum of current journals and texts on geology, mineral deposits and mineral exploration. A small but steadily expanding library of theses on the geology of the NWT is also maintained for the Geology Division by the Technical Library.

Assessment work reports for most of the mineral exploration done in the Territories are available in both the original format and on microfiche. Oil and gas exploration reports are available on microfiche. Access to the GEOSCAN-Minisis data base, a bibliographic index to geological information on NWT, is available through the Division's computers.

For many years the Geology Division has reviewed periodicals for information on NWT mining properties. An archive of journal articles on geology relevant to the NWT continues to be developed.

A facility, the C.S. Lord Core Library, is maintained for the storage, examination and processing of drill cores and rock samples.

Advice to the public, rock and mineral collectors, prospectors and the mineral industry is available from a staff of 12 (as of 1989), which includes 8 geologists and 4 support staff.*

Claim maps and property ownership maps are available for inspection or purchase from the Northern Affairs Program Drafting Section through the Mining Recorder's office. Topographic maps and some aeromagnetic and geological maps can be purchased from the Regional Surveyors' office (EMR). Most are on file in the NWT Geology Division Archives geological and geophysical maps.

The Geology Division in Yellowknife is a repository for Geological Survey of Canada (GSC) releases on the geology, mineral deposits and the mineral industry of the NWT. Most GSC publications are available for examination or loan; most GSC open files germane to the NWT are available for purchase. In addition numerous open file reports and maps on the geology of NWT produced by division staff and contractors can be obtained from the Geology Division. Since 1988, NWT-MDA open files have also been made available through the Geology Division's open file system.

GEOLOGY DIVISION PUBLICATIONS

The NWT Region Geology Division produces numerous publications each year which can be obtained from the Geology Archives, DIAND, Box 1500, Yellowknife, XIA 2R3. A list of available publications and reprints, and the cost of each, is also maintained by the Archives.

The Geology Division produces yearly overviews of mining exploration and geological survey work, a preview of mineral exploration and of geological mapping, and numerous open file releases; 15 were produced in 1986, 12 in 1987 and 15 in 1988.

* *As a result of Federal Government restraint the staff of the NWT Geology Division was cut by 8.33% in 1989 resulting in the loss of the manager of the Core Library.*

TABLE 1-8: 1987 CANADA-NWT MINERAL DEVELOPMENT AGREEMENT FIELD PROGRAM

UNIVERSITY PROFESSOR/STUDENT	AMOUNT (Thousand)	PROJECT
University of Toronto Professor E.T.C. Spooner Student: Andy Abraham (Ph.D.)	$20	Detailed mapping and studies of gold-quartz veins in granitoids in the northern Slave Province (mainly Anialik River area, NTS 76 M/11 and 14). This work will be co-ordinated with memoir preparation for the Hepburn Island area, 76 M (V. Jackson *et al.*).
Dalhousie University Professors M. Zentilli & N. Culshaw Student: Tim Stokes (Ph.D.)	$10	Study of Knight Bay-type turbidite-hosted gold deposits (Gordon Lake area, NTS 85 I/14, 85 P/13). This work will be co-ordinated with detailed structural studies of the Slave Province (Fyson) and studies of turbidite-hosted quartz veins (Brophy).
University of Ottawa Professor W.K. Fyson Student: Dan Roach (Ph.D.)	$25	Mapping of the Beniah Lake straight zone to determine its relationship to the evolution of the Beaulieu River supracrustal belt and its potential as a locus for gold mineralization. Geological maps of the supracrustal (mainly volcanic) belt will be generated. Work will be co-ordinated with MDA mapping (Carp Lake-Tundra area mapping project).
University of Manitoba Professor P. Cerny, Dr. Weiss (post Doc.) and various students	$20	Studies of rare element pegmatites of the NWT to map and characterize significant rare element pegmatites and produce reports on the mineralogy and petrology.

More formal publications include this Mineral Industry Report which provides archival data on mineral exploration in the NWT. It is produced biannually. Papers on the geology of the NWT, mainly reports on work done by university researchers supported by the NWT Geology Division, are now published in Contributions to the Geology of NWT, a referred journal produced from time to time by the Division. Division staff also publish in professional and mining industry journals.

In addition to Geology Division releases, numerous out-of-print Geological Survey of Canada geological maps of the NWT can be obtained in the form of ozalid prints, and numerous papers and reports by contractors and others are also available. These are all in the list of publications.

Publications released since the last Mineral Industry Report was produced are listed below.

RECENT PUBLICATIONS

Available from:

**NWT GEOLOGY DIVISION
NORTHERN AFFAIRS PROGRAM
DIAND
Box 1500, Yellowknife
Northwest Territories
XIA 2R3**

Mineral Industry Report, 1984-85, Northwest Territories; by J.A. Brophy, J.C. Crux, W.A. Gibbins, P.J. Laporte, W.A. Padgham and J.B. Seaton; C.E. Ellis, editor (1987); NWT Geology Division, DIAND, Yellowknife, NWT. (N/C)

Contributions to the Geology of the Northwest Territories, Vol. 3; W.A. Padgham, editor (1988), NWT Geology Division, DIAND, Yellowknife, NWT. (N/C)

EGS 1987-1 Exploration Preview, NWT-1987; by geological staff; C.D. Gault, editor; NWT Geology Division, DIAND, Yellowknife, NWT; 1 text, 9 p. (N/C)

EGS 1987-2 Geology of Tent Outlier; Nonacho Basin, parts of NTS 75 J/5, 10, 11, 12, 14, 15; scale 1:50,000; by L.B. Aspler; 1 map (unedited). ($3.00)

EGS 1987-3 Geology and structure of the Cameron River Belt, Fenton Lake area, parts of NTS 85 I/15, P/2; scale 1:10,000; by R.D. Cullen; 2 maps with marginal notes. ($10.00/set, $5.00 each)

EGS 1987-4 Structure and geology of the Wilson Island Group, parts of NTS 75 L/3, 4, 85 H/10, 11, 14, 15; scale 1:25,000; by B.J. Johnson; 5 maps with marginal notes. ($15.00)

EGS 1987-5 Geology of the Bell Island Group, Hottah Lake area, parts of NTS 86 E/1, D/16; scale 1:25,000; by I. Reichenbach; 1 map. ($5.00)

EGS 1987-6 Proceedings of the Seminar on Native Participation in Mining, March 18 and 19, 1987, Yellowknife, NWT; 1 text, 133 p. ($6.70)

EGS 1987-7 Carvingstone and Inuit Carvings: Unique Northern Canadian Resources; by W.A. Gibbins; 1 text, 36 p. ($2.00)

EGS 1987-8 Preliminary Geological Map of the Arcadia Bay Property/ Coronation Gulf, NWT; part of NTS 76 M/11; scale 1:15,000; Canada-NWT Mineral Development Agreement; by A.P.G. Abraham; 1 map and 1 text, 26 p. ($3.50)

EGS 1987-9 Preliminary Geology of Beniah Lake area; NTS 85 P/8; scale 1:50,000; compiled by W.A. Padgham; 1 map with marginal notes. ($4.00)

EGS 1987-10 Preliminary Geology of the Kathawachaga Lake area (North Half); NTS 76 L/9, 11, 12, 13; scale 1:50,000 (except 76 L/9 at 1:31,680); by V.A. Jackson, P. Chawrun, S. Edbrooke, H. Falck, C.D. Gault, A-M. Hamilton, D. Kerr, T. Mayor, J. McCorquodale and G. Potts; 4 maps and accompanying notes and legend. ($15.00/set, $3.00/each)

EGS 1987-11 Geology of the Russell Lake area; NTS 85 O/4; scale 1:50,000; compiled by V.A. Jackson; 1 map with marginal notes. Superseded by EGS 1988-11.

EGS 1987-12 Preliminary Geology: Hope Bay Volcanic Belt, Northern Portion; parts of NTS 77 A/3, 6; scale 1:50,000; by W.A. Gibbins; 1 map with marginal notes. ($4.00)

EGS 1988-1 Exploration Preview, NWT-1988; by geological staff; C.D. Gault, editor; NWT Geology Division, DIAND, Yellowknife, NWT; 1 text, 16 p. (N/C)

EGS 1988-2 Geology of the Southeast part of Yellowknife Bay, part of NTS 85 J/8; scale 1:20,000; by D. Roach; 1 map with marginal notes. ($5.25)

EGS 1988-3 Evaluation of Rare-Element Pegmatites in NWT; Preliminary, Progress and Final Reports, parts of NTS 27 C; 56 M; 75 M; 76 C; 85 I; & 85 J/1, 8, 9, 16; Canada - NWT Mineral Development Agreement; by P. Cerny; 3 texts, 128 p. ($6.50)

EGS 1988-4 Structural Mapping of the Gordon Lake 'Refold', NWT: A model for the focusing of late-stage gold bearing quartz breccia-vein systems, part of NTS 85 I/15 & 85 P/3; scale approximately 1:20,000; Canada - NWT Mineral Development Agreement; by Tim Stokes, Nicholas Culshaw and Marcos Zentilli; 1 map and 1 text, 28 p. ($3.00)

EGS 1988-5 Mineralogy of the Lake Zone, Thor Lake, NWT, part of NTS 85 I; by D. Robert Pinckston and Dorian G.W. Smith; 1 text, 13 p. ($0.75)

EGS 1988-6 Mineral Showings and Property Compilation, Southeast Barren Grounds, Districts of Keewatin and Mackenzie; parts of NTS 55, 56, 65, 66, 75, 76; scale 1:1 000 000; compiled by K. Griep; 1 map. Superseded by EGS 1989-13.

EGS 1988-7 Clastic Dykes in Volcanic Rocks of the Giant Section, Yellowknife, NWT, part of NTS 85 J/9; by Hendrik Falck and J.A. Donaldson; 1 text, 12 p. ($0.60)

EGS 1988-8 Mineral Occurrences of the Indin Lake area (north half), parts of NTS 86 B/3, 6; scale 1:50,000; Canada - NWT Mineral Development Agreement; by John Morgan; 1 map with marginal notes. ($3.00)

EGS 1988-9 Interim Field Report - Ennadai Lake Project; and, Sedimentology, Structure and Economic Geology of the Poorfish - Windy Thrust Fold Belt, Ennadai Lake area, Keewatin, parts of 65 C; Canada - NWT Mineral Development Agreement; by L.B. Aspler; 2 texts, 7p and 33p. ($2.00) (Enlarged figures also available upon request [$3.00])

EGS 1988-10 Property Compilation and Showings Map, Slave Structural Province, parts of NTS 75, 76, 85, 86; scale 1:1 000 000; by J.A. Brophy; 1 map. ($3.00)

EGS 1988-11 Geology of the Russell - Slemon Lakes area, NTS 85 0/4; scale 1:30 000; by V.A. Jackson; 1 map with marginal notes. ($4.00)

EGS 1988-12 Preliminary Geology of the Hurwitz Group, Kaminak Lake - Tavani area (Kaminak - Quartzite Belt and Whiterock Belt), parts of NTS 55 L/4, 7; K/4; scale 1:15 840 (1"=1/4 mile); Canada - NWT Mineral Development Agreement; by Judy Patterson; 3 maps. ($6.50)

EGS 1988-13 Stratigraphy and lithology of the Upper Ross Lake area, parts of NTS 85 I; by T.M. Kusky; 2 maps with marginal notes. ($6.00)

EGS 1988-14 Pegmatite Studies in the Alymer Lake area - a preliminary report, parts of NTS 75 M, 76 C, D; Canada - NWT Mineral Development Agreement; by P. Cerny, P. Tomascak and M.A. Wise; 1 text, 11 p. ($0.60)

EGS 1988-15 Report on Reconnaissance work in the M1, M2 and QULIK 1 Claims, Chantrey Inlet, NWT, parts of NTS 56 M/6; Canada Mineral Development Agreement; by P. Cerny, M.A. Wise, and P. Tomascak; 1 text, 39 p. ($2.00)

EGS 1988-16 Late Quaternary Marine Record of the Cape Parry-Clinton Point Region, District of Mackenzie, parts of NTS 97 C, D; in GSC Paper 1989-1, Current Research, Part D; by D.E. Kerr; 1 text, 12 p. ($0.70)

EGS 1989-1 Exploration Preview, NWT - 1989; by geological staff; C.D. Gault, editor; NAP Geology Division, NWT; 1 text, 17 p. (N/C)

EGS 1989-2 Pegmatite Studies in the Alymer Lake area, Northwest Territories, parts of NTS 75 M, 76 C, D; Canada - NWT Mineral Development Agreement; by P. Cerny, P. Tomascak and M.A. Wise; 1 text, 14 p. ($0.80)

EGS 1989-3 Reconnaissance of M1, M2 and QULIK 1 Claims, Chantrey Inlet, NWT, part of NTS 56 M/6; by P. Cerny, M.A. Wise and P. Tomascak; 1 text, 16 p. ($0.90)

EGS 1989-4 Analysis of Gossans, Exploration Guides, and Economic Evaluation, Poorfish - Windy Thrust/Fold Belt, Ennadai Lake area, District of Keewatin, part of NTS 65 C; Canada - NWT Mineral Development Agreement; by L.B. Aspler; 1 text, 43 p. ($2.20)

EGS 1989-5 The Kaminak Lake Alkaline Intrusion, parts of NTS 55 L; scale 1:17 000; Canada - NWT Mineral Development Agreement; by P.A. Cavell and H. Baadsgaard; 1 map and 1 text, 22 p. ($2.50)

EGS 1989-6 Tonalite-Hosted Au-Quartz Vein/Shear Zone Mineralization in the Arcadia Bay area, Slave Province, NWT, part of NTS 76 M/11; Canada - NWT Mineral Development Agreement; by A.P.G. Abraham; 1 text, 70 p. ($3.50)

EGS 1989-7 Preliminary Geology of the Torp Lake area, parts of NTS 76 N/5, 6; scale 1:30,000; Canada - NWT Mineral Development Agreement; by R. Johnstone; 1 map with marginal notes. ($3.00)

EGS 1989-9 Preliminary Geology of the Beniah Lake area; NTS 85 P/8; scale 1:30,000; Canada - NWT Mineral Development Agreement; by D. Roach; 1 map with marginal notes. Superseded by EGS 1990-2. ($3.00)

EGS 1989-10 Preliminary Geology and Mineral Occurrence Compilation of the Southern Half of the Hope Bay Metavolcanic Belt; parts of NTS 76 O/8, 9, 10, 15, 16 & 76 P/13, 14; scale 50 000; Canada - NWT Mineral Development Agreement; by J. Gebert; 1 map with marginal notes. (unedited)($3.00)

EGS 1989-11 Preliminary Geological Compilation of Hepburn Island Map area (76 M); scale 1:125,000; by V.A. Jackson; 1 map with marginal notes. ($5.00)

EGS 1989-12 Geology of the Spencer Lake area; parts of NTS 85 P/1, 2; scale 1:50,000; Canada - NWT Mineral Development Agreement; by M. Stubley; 1 map with marginal notes. Revised November, 1989. ($3.00)

EGS 1989-13 Mineral Showings and Property Compilation, Southeast Barren Grounds, Districts of Keewatin and Mackenzie; parts of NTS 55, 56, 65, 66, 75, 76; scale 1:1 000 000; updated by A. Enge; 1 overlay to EGS 1989-14. ($10.00 mylar; $4.50 paper)

EGS 1989-14 Mineral Potential and Geology of the Southeastern Barren Grounds, Districts of Keewatin and Mackenzie; parts of NTS 55, 56, 65, 66, 75, 76; scale 1:1 000 000; compiled by A. Enge; 1 map. ($4.50)

EGS 1989-15 Mineral Potential and Geology of Slave-Bear Structural Provinces, District of Mackenzie; parts of NTS 75, 76, 85, 86; scale 1:1 000 000; compiled by A. Enge; 1 map. ($3.00)

EGS 1989-16 Report on Preliminary Assessment of the Geology and Mineral Potential of the early Proterozoic Hurwitz Group, District of Keewatin; parts of NTS 55 L/4, 7 & 55 K/4; Canada - NWT Mineral Development Agreement; by J. Patterson; 1 text, 32 p. ($1.60)

EGS 1989-17 A Structural and Lithologic model for the formation of gold bearing quartz breccias at Gordon Lake, NWT; parts of NTS 85 I/15 & 85 P/3; scale approximately 1:20,000; Canada - NWT Mineral Development Agreement; by T. Stokes, M. Zentilli and N. Culshaw; 1 map and 1 text, 33 p. ($3.00)

EGS 1989-19 Geological Map of the Arcadia Bay area, Coronation Gulf, NWT; parts of NTS 76 M/11; scale approximately 15 000; Canada - NWT Mineral Development Agreement; by A.P.G. Abraham; 1 map. ($4.00)

EGS 1989-20 NWT - Cordilleran Region, Mineral Potential; parts of NTS 95, 96, 106; scale 1:2 500 000; compiled by D. Atkinson; 1 map ($2.00)

EGS 1989-21 Preliminary Geology of the Pistol Bay area, parts of NTS 55 K/1, 2, 6-11; scale 1:30 000; Canada - NWT Mineral Development Agreement; by S. Goff; 2 maps with marginal notes ($8.00)

EGS 1989-22 Geology of the Hawk Hill - Griffin - Mountain Lakes area, District of Keewatin; part of NTS 65 G; scale 1:50 000; Canada - NWT Mineral Development Agreement; by L.B. Aspler; 1 map ($4.00)

EGS 1989-23 Pegmatite Studies in the Alymer Lake area, Northwest Territories - Preliminary Report, 1989 Field Season; parts of NTS 75 M, 76 C, D; Canada - NWT Mineral Development Agreement; by P. Cerny, and P. Tomascak; 1 text, 14 p. ($0.80)

EGS 1989-24 Geology of the Southern Kathawachaga area (76 L); scale 1:30 000; by V.A. Jackson; 6 maps ($24.00)

EGS 1989-25 Preliminary Geology of the Central Hope Bay Metavolcanic Belt; parts of NTS 76 O/15, 16; scale 1:50 000; Canada - NWT Mineral Development Agreement; by J. Gebert; 1 map. (unedited)($3.00)

EGS 1989-26 Preliminary Geology of the Torp Lake Metasedimentary Belt; parts of NTS 76 N/5, 6, 3; scale 1:31 000; Canada - NWT Mineral Development Agreement; by R. Johnstone; 1 map. (unedited)($6.00)

EGS 1990-1 Gold Deposit Zoning in the Archean Slave Structural Province; parts of NTS 75, 76, 85, 86; scale 1:1 000 000; updated by W.A. Padgham; 1 map and overlay. Supersedes EGS 1986-3. ($3.50 base map; $1.50 paper overlay; $10.00 mylar overlay)

EGS 1990-2 Geology of the Beniah Lake area; NTS 85 P/8; scale 1:30 000; Canada - NWT Mineral Development Agreement; by D. Roach; 1 map. Supersedes EGS 1989-9. (unedited)($3.00)

EGS 1990-3 Surficial Geology of the Yellowknife River Basin; parts of NTS 85 I, J, O, P & 86 A; scale 1:250,000; by D. Kerr; 1 map ($3.00)

CHAPTER 2
OPERATING MINES

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Kate Hearn, Research Geologist

INTRODUCTION

At the beginning of 1986, eight mines were operating in the NWT: four gold mines, three lead-zinc mines and one tungsten mine. By the end of 1987, the number of operating mines was reduced to six: five gold mines and two lead-zinc mines (Fig. 2-1). Tom Mine was brought into production in September 1986. Cantung Mine closed in mid-1986 and Salmita Mine closed in early 1987. Pine Point Mine ceased mining at the end of June 1987, but continued to mill stockpiled ore into 1988. Production statistics for the 1986 and 1987 are summarized in Table 2-1.

The reports on RED 24 and Bullmoose projects were written by Kate Hearn. The rest of this chapter was written by Carol Ellis.

MINERAL PRODUCTION

The NWT ranked sixth in Canada for mineral production in 1986, ahead of Newfoundland, Manitoba, New Brunswick Nova Scotia and Yukon, by contributing 2.4% of Canada's total mineral production, including metals, oil and gas and industrial minerals. In 1987 the NWT ranked seventh in Canada for mineral production but its contribution to Canada's total mineral production increased to 2.6%. The NWT contributed 12% of Canada's gold production in 1986 (Table 2-2) and 10% in 1987. Silver production was 2.5% of Canada's total in 1986 and 1.8% in 1987. Lead and zinc production were both roughly 40% of Canada's production for both years. Cantung Mine was Canada's only tungsten producer in 1986.

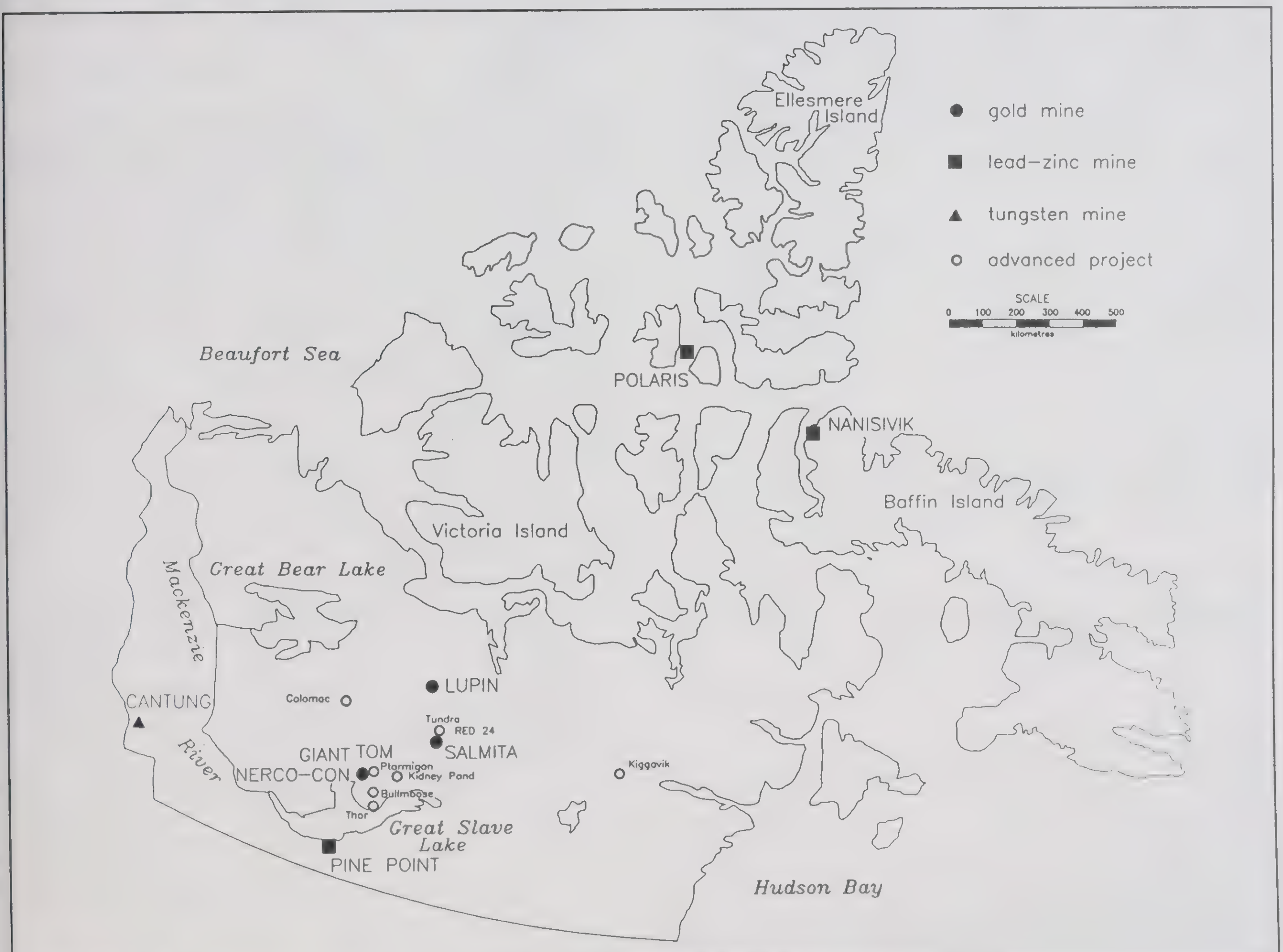

FIGURE 2-1: Mines and advanced projects in the Northwest Territories, 1986-87.

Table 2-1: Production Statistics for mines operating in the Northwest Territories during 1986 and 1987.

Mine	Commodities	Ore Milled	Production	Reserves (proven and probable)	Grade
NERCO Con	gold, silver	197 584 t	2777 kg Au	1 296 995 t	14.1 g/t Au
			519 kg Ag		
		192 000 t	*2576 kg Au*	*2 437 711 t*	*11.3 g/t Au*
			515 kg Ag		
Giant	gold, silver	292 165 t	1993 kg Au	938 930 t	8.8 g/t Au
			768 kg Ag		
		338 725 t	*2380 kg Au*	*953 446 t*	*8.44 g/t Au*
			606 kg Ag		
Tom	gold, silver	10 800 t	61 kg Au	13 600 t	13.03 g/t Au
		8 285 t	*85 kg Au*	*not reported*	
Salmita	gold, silver	63 380 t	1529 kg Au	10 885 t	25.7 g/t Au
			247 kg Ag		
		21 155 t	*545 kg Au*	--	--
			114 kg Ag		
Lupin	gold, silver	587 530 t	6009 kg Au	2 771 250 t	11.8 g/t Au
			995 kg Ag		
		613 380 t	*6006 kg Au*	*3 396 480 t*	*11.4 g/t Au*
			882 kg Ag		
Pine Point	zinc, lead	2 967 000 t	238 900 t Zn	3 357 000 t	9.6% Zn
			109 950 t Pb		3.5% Pb
		3 188 000 t	*287 700 t Zn*	*680 000 t*	*10.4% Zn*
			114 220 t Pb		*3.4% Pb*
Polaris	zinc, lead	886 000 t	114 360 t Zn	18 145 000 t	14.5% Zn
			25 100 t Pb		3.9% Pb
		984 000 t	*128 800 t Zn*	*15 060 000 t*	*14.4% Zn*
			26 545 t Pb		*3.9% Pb*
Nanisivik	zinc, lead, silver	685 800 t	58 400 t Zn	2 818 400 t	9.9% Zn
			3500 t Pb		0.3% Pb
			24 800 kg Ag		40 g/t Ag
		679 100 t	*57 900 t Zn*	*2 571 700 t*	*10.1% Zn*
			2 500 t Pb		*0.3% Pb*
			23 000 kg Ag		*45 g/t Ag*
Cantung	tungsten	136 980 t	197 000 STU WO_3	1 270 000 t	1.2% WO3
		--	--	*1 270 000 t*	*1.2% WO3*

Figures for 1986 are in normal print; *figures for 1987 are in italics.*
sources: Company annual reports, Mines Inspection Office, GNWT

***Table 2-2**: Value of mineral production for the Northwest Territories and Canada, 1986 and 1987.*

	Northwest Territories				Canada			
commodity	1986		1987		1986		1987	
	production	value ($million)	production	value	production	value ($million)	production	value ($million)
gold	12 308 kg	202.1	11 507 kg	219.0	102 889 kg	1689.3	115 818 kg	2204.5
silver	27 329 kg	6.9	25 117 kg	7.5	1 088 t	275.0	1 375 t	424.1
zinc	411 660 t	500.2	474 400 t	604.4	988 000 t	1200.6	1 158 000 t	1475.2
lead	138 550 t	94.4	143 265 t	151.4	334 000 t	227.7	373 000 t	394.8
tungsten	1 420 t	9.9	--	--				
total		$813.4		$982.4		$33 854.4[1]		$36 342.3[1]

[1] total value for all minerals produced in Canada
sources: Company annual reports and Canada Minerals Yearbooks, EMR.

The value of mineral production for the NWT for 1986 exceeded $810 million, a slight increase over 1985. In 1987 the value increased to over $980 million, due to increases in metal prices and accelerated production at Pine Point Mine.

ADVANCED PROJECTS

In 1986, Hecla Mining Corporation, under an agreement with Highwood Resources, commissioned a marketing study of future demand for, and markets for beryllium and related by-products from the Thor Lake deposits (see Chapter 6). Urangesellschaft undertook a pre-feasibility geotechnical study of the Kiggavik deposit and continued to drill the Main and Centre zones to further delineate the deposit (see Chapter 5).

Neptune Resources acquired a 60% interest in the Colomac property in late 1986 (see chapter 8). In 1987 Neptune drilled 138 holes, totalling 10 811 m, to better define reserves for economic zones of the Colomac sill. Neptune Resources planned to recovery the gold using a vat-leach process, and undertook a pilot project to test the technology under sub-arctic conditions. For 35 days, during October and November 1987, 1360 t of ore grading 3.09 g/t Au was treated in the test vat; 80% recovery was attained and a 3.36 kg dore bar was produced using the vat-leach process (Northern Miner, Dec. 14, 1987).

At Terra Mines Ltd. Bullmoose project, east of Yellowknife, underground development continued. In early 1987, Terra Mines decided not proceed with production and preparations were made to abandon the site.

Refractory ore from an open pit on the Red 24 claim, just north of Salmita Mine, was treated using a bio-leach process developed by Giant Bay Resources. The recovery rate increased to 95.6% when the bio-leach circuit was added to the conventional cyanide circuit, compared to 75-78% recovery using only the cyanide circuit.

In September 1987, Getty Resources and Noranda Exploration, joint venture partners in the Tundra project north of Salmita Mine, announced plans to sink an exploration shaft to recover a bulk sample for metallurgical testing and to continue to explore the deposit from underground. Reserves for the Tundra deposit are estimated to be 24 Mt at a grade of 6.2 g/t Au (see chapter 8).

In September 1986, Treminco Resources optioned the Ptarmigan Mine from Cominco; Treminco fulfilled the option to purchase agreement in late 1987. Treminco plans to bring the Ptarmigan Mine into production during the second quarter of 1988.

In 1986, Giant Bay Resources began underground development on the Kidney Pond zone at Gordon Lake. Underground development, diamond drilling and bulk sampling continued in 1987 (see Chapter 8).

NERCO-CON MINE

NERCO-Con Mine Ltd.	Gold, Silver
P.O. Box 2000	85 J/8
Yellowknife, NWT	Con Shaft:
X1A 2M1	62°26'22"N, 114°22'08"W

REFERENCES

Boyle (1961); Brophy (1984); Bullis, *et al.*, 1987; Campbell (1947); Helmstaedt and Padgham (1986); Henderson (1985); Henderson and Brown (1966); Padgham (1987).

PROPERTY

CON 1-4, GG 1-14, MEG 1-10, MIDNIGHT 1, NEGUS 1-4, PIZ 1-2, P&G 1-4, ROSE, SOL 1-4, STAR 1-2.

LOCATION

NERCO Con Mine is on the south side of the City of Yellowknife (Fig. 2-2).

HISTORY

Con, Rycon and Negus mines developed separately during the late 1930's; Cominco consolidated the properties in the early 1950's. The Con group of claims were staked in September and October 1935 for Consolidated Mining and Smelting. A shaft was started in the summer of 1937. On September 5, 1938 Con Mine

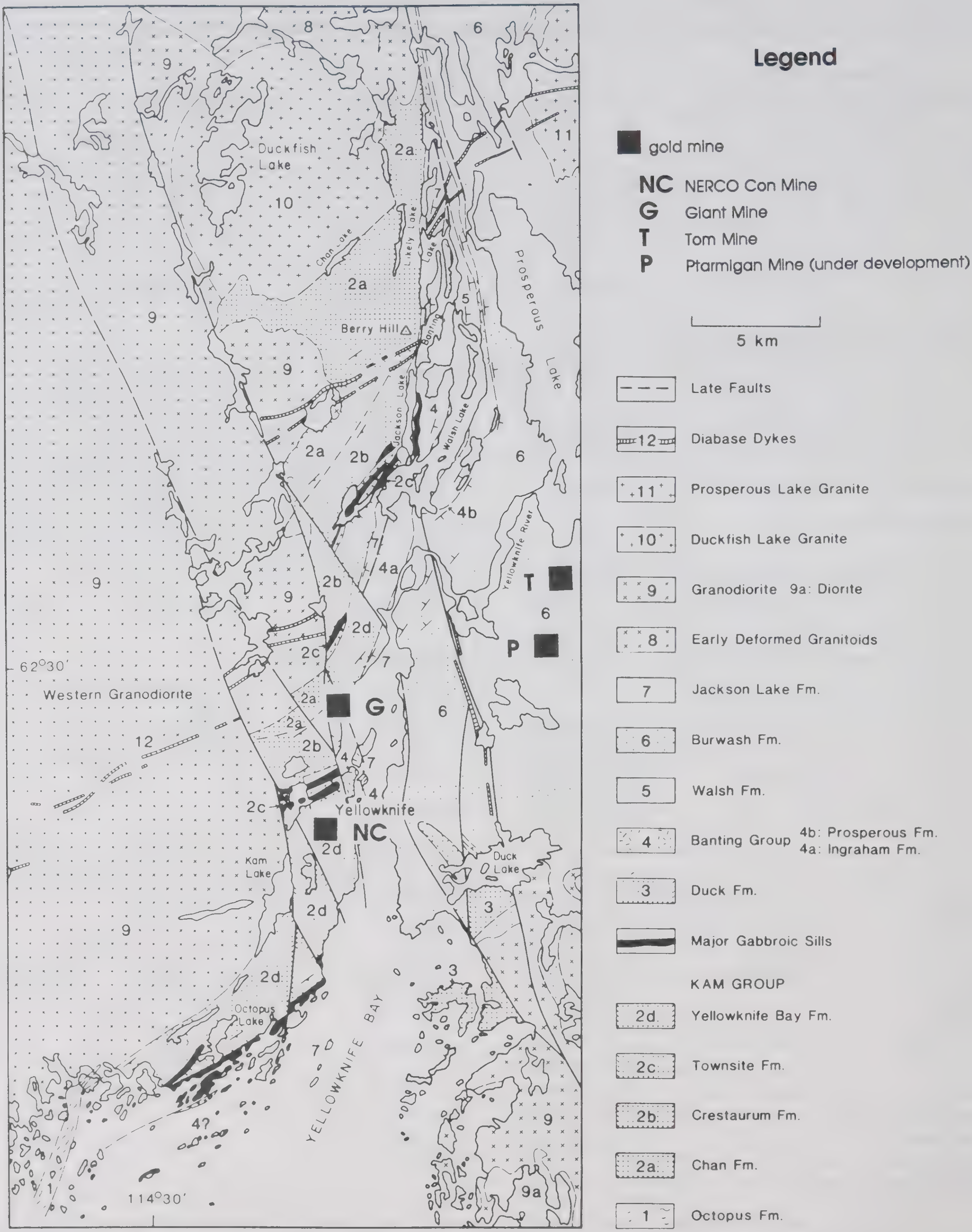

FIGURE 2-2: Geology of the Yellowknife area, showing NERCO Con, Giant, Tom and Ptarmigan mines (from Helmstaedt and Padgham, 1986).

poured the first gold brick in the NWT. The P&G claims were staked by G. Latham and T. Payne. Consolidated Mining and Smelting obtained controlling interest in the property in 1937 and formed Rycon Gold Mines Ltd to explore and develop the property. Ore from Rycon Mine was treated at the Con mill.

The NEGUS group was staked in 1936 by O. Hagen and others. Negus Mine became the second gold producer in the NWT when it poured its first gold brick in February 1939. Negus Mine closed in 1952 because of depleted reserves. Cominco acquired the mineral rights to the Negus claims in 1953.

Production was suspended from 1943 to 1946 because of labourer shortage during WW II. During this time Neil Campbell, using faults and dykes, determined that continuation of the Giant shear zone, offset by the West Bay Fault, continued under the CON-RYCON-NEGUS properties. The Campbell shear zone has been the source of most ore at CON since 1958. In 1970, the mill was converted to treat free-milling gold found at deeper levels of the Campbell shear zone. The Robertson shaft, completed in 1977, made the lower workings of the Campbell shear zones accessible.

By the end of 1985, 134 585 kg Au had been produced 6 658 964 t of ore from the Con, Rycon-Negus and Campbell shear zones (Bullis *et al.*, 1987).

DESCRIPTION

The northerly trending Yellowknife volcanic belt is a sequence of north-northeasterly striking, steeply dipping Kam Group mafic flows and tuffs, intruded by numerous dykes and sills. The volcanic belt is overlain to the east by a turbidite basin, and intrude from the west by the Western Granodiorite. Metamorphic grade ranges from greenschist in the upper part of the Kam Group to amphibolite grade near the contact with the Western Granodiorite. The Yellowknife volcanic belt has been described by Boyle (1961), Henderson and Brown (1966) and Helmstaedt and Padgham (1986) and Padgham (1987).

Helmstaedt and Padgham (1986) proposed raising the Kam Formation to group status, and establishing four formations: Chan, Crestaurum, Townsite and Yellowknife Bay formations (Fig. 2-2).

The Campbell shear zone, from which the bulk of production for the Con Mine has come, cuts the Yellowknife Bay Formation, the upper most formation of the Kam Group. Volcanic flows strike 050° and dip steeply to the southeast; the Campbell Shear zone strikes 030° and dips 40° to the west. The shear zones vary in width and contain numerous flexures, splays and blocks of unsheared to weakly sheared volcanics. The Campbell shear zone is 60 m to 300 m wide, has been traced for about 8 km and is truncated to the north by the West Bay fault. Orebodies are tabular and range in size from 1.5 m to 18 m thick, 15 to 180 m along strike and up to 180 m along dip.

Gold is in intensely folded, brecciated and boudinaged quartz-ankerite veins, hosted a sericite-chlorite-carbonate schist. Other minerals in the orebodies include pyrite, pyrrhotite, arsenopyrite, sphalerite, galena, chalcopyrite, scheelite, tourmaline and sulphosalts. Sulphide content does not exceed 5%, and is usually less than 2%. Above the 3100 level ore is refractory, gold is associated with arsenopyrite. Below 3100 level, now the main area of production, gold is free milling; above this level ore is refractory.

CURRENT WORK AND RESULTS

Cominco, in an effort to reduce its debt load, sold Con Mine to NERCO Minerals Company in December 1986 for $64 million. Because of the impending sale of the mine, exploration during 1986 was restricted to areas being developed for production.

In 1987, US$13.7 million were spent on capital improvements at Nerco Con Mine. Production was from the 3900-ft level to the 5100-ft level. In addition to exploration and development on the producing levels, the north end of 4900-ft level and 5300-ft level and the south end of the 5700-ft level were being explored and developed (pers. comm. with mine staff). Fifteen holes totalling 2400 m were drilled on surface between the Rycon and Negus shafts.

NERCO Con Mine began to re-examine older workings in the Campbell shear zone between the 2300-ft and 3100-ft levels to assess to the possibility of removing crown and stope pillars with remote control scoop trams and to re-evaluate lower grade zones.

Gold production was 2777 kg in 1986 and 2576 kg in 1987 (Tab. 2-1). Since 1938, 139 940 kg of gold has been recovered from 7 048 550 t of ore.

GIANT MINE

Giant Yellowknife Mines Ltd.	Gold
Bag Service 3000	85 J/8,9
Yellowknife, NWT	'C' Shaft:
X1A 2M2	62°29'57"N,
	114°21'40"W

REFERENCES

Campbell (1947); Helmstaedt and Padgham (1986); Henderson (1985); Henderson and Brown (1966); Lewis (1987); Padgham (1987).

PROPERTY

AES 27-50; 1 FB claim; GIANT 1-21; GIANT X1-X5; LAW 2-3; 6 LOLOR claims.

LOCATION

Giant Mine is 5 km north of Yellowknife (Fig. 2-2).

HISTORY

The GIANT claims were staked in 1935 by C.J. Baker and H.M. Muir for Burwash Yellowknife Mines Ltd. Giant Yellowknife Mines was incorporated in 1937 and acquired the ground. First production was from the Brock veins in 1939 and 1940: roughly 110 t containing 28 kg of gold and 9 kg of silver was hand sorted and sent to Trail B.C. for treatment.

In 1944 diamond drilling, to test the idea that Baker Creek valley was underlain by a large shear system, delineated the largest tonnage gold deposit in the NWT at that time. Development of the mine infrastructure began in 1945. Giant poured its first gold brick in May 1948.

Giant acquired an interest in the Lolor group in 1948 and did some development work in the fifties and mid-sixties. The Supercrest group, staked in 1936, is owned jointly by Akaitcho Yellowknife Mines Ltd. and Giant Yellowknife Mines Ltd. Production from both Lolor and Supercrest commenced in 1967 from extensions from Giant Mine's underground workings.

Production from open pits began in 1974 and have contributed roughly 40% of Giant production in recent years.

In November 1985, Giant poured its 10 000th gold brick.

DESCRIPTION

The Giant deposit is a system of gold-bearing quartz-carbonate-sericite shear zones cutting Kam Group volcanics of the Yellowknife volcanic belt.

The Yellowknife volcanic belt, a northerly trending Archean greenstone belt, has been described by Boyle (1961), Henderson and Brown (1966) and Helmstaedt and Padgham (1986). The regional geology is shown in Figure 2-2.

Kam Group massive and pillowed flows trend northeasterly and dip steeply to the southeast. The Giant shear system strikes roughly 030° and dips predominantly to the west, crosscutting the Kam Group volcanics at a low angle. Shear zones have been traced for 6.5 km and extend to a depth of more than 600 m.

Orebodies comprise irregular lenses of quartz-carbonate veins enveloped by sericite-chlorite-carbonate schist. Other minerals include pyrite, arsenopyrite, sphalerite, chalcopyrite, stibnite, sulphosalts and pyrrhotite. Ore is refractory; gold is associated with arsenopyrite and pyrite. Orebodies tend to follow the plane of the shear zone and are developed at flexures in the shear zone and intersections of shear zones (Lewis, 1987).

Most of the orebodies at Giant are in a wedge of volcanics bounded to the south by the West Bay fault and to the north by the Akaitcho fault. The GKP zone is north of the Akaitcho fault.

CURRENT WORK AND RESULTS

The C-Crown pit, the only open pit mined in 1986, contributed 31.2% of the mill feed that year. In 1987, mining of the C-1 pit was completed and mining commenced in B-3 and A-2 pits. The open pits contributed 35.8% of the mill feed.

Mining of the U.B.C. zone was completed in 1986, but ore continued to be removed during 1987.

By the end of 1986 the 2nd level of the GKP zone, on the Supercrest property, had been developed; the 3rd level was developed by the end of 1987. Production was from the 1st level in 1986 and the second level in 1987. The GKP orebody is more irregular and discontinuous than was indicated by diamond drilling. Reserves below the third level have been removed from the proven or probable categories until further drilling is done.

Lateral development increase to 5540 m in 1986 from 4485 m in 1985. In 1987, a ramp was driven from surface to the 1250 level. Lateral development, including ramp development, increased to 8290 m in 1987. Definition drilling increased by roughly 25% in 1986 to 9907 m, but decreased in 1987 to 8230 m in 1987.

A crusher was installed on surface in 1986 to process ore from the open pits and satellite zones, by-passing the underground crushing system.

Gold recovery increased to 87.3% in 1986, due in part to the installation of a carbon stripping circuit, which recovers gold form the activated carbon used to extract gold from the roaster gases. Gold recovery was 86.6% in 1987.

In 1987, a 100 t/d pilot plant was built to determine the feasibility of recovering gold from the tailings. The plant operated from June to August and a recovery rate of 38% was attained. The decision was made to proceed with the project, and by the end of 1987, $4.4 million had been spent on site preparation and $3.3 million on a new tailings dam.

Gold production was 1992 kg in 1986 and 2380 kg in 1987 (Tables 2-1 and 2-2). Since 1948, approximately 183 850 kg of gold has been recovered from 11 931 000 t of ore.

In August 1986, Pamour Inc. acquired Falconbridge Ltd.'s 19.16% share in Giant Yellowknife Mines Ltd. Giant Yellowknife acquired Pamour's mines in the Timmins area of Ontario in January 1987, increasing Pamour's interest in the company to 50.2%. Pamour's parent company, Giant Resources of Australia, acquired a 16.7% direct interest in the company in September in September 1987, reducing Pamour's interest to 41.8%

TOM MINE

Treminco Resources Ltd.	Gold
1110 - 625 Howe St.	85 J/9
Vancouver, B.C.	62°32'N
V6C 2T6	114°11'W

REFERENCES

Brophy (1987), Henderson (1975), Padgham and Brophy (1986)

DIAND Assessment Report: 062212

PROPERTY

TOM claim

LOCATION

Tom Mine is 21 km northeast of Yellowknife by road (Fig. 2-2).

HISTORY

The TOM claims were staked in 1936 by T. Cassidy, who optioned the property to Consolidated Mining and Smelt Company (now Cominco) in 1939. Between 1939 and 1945, Cominco did geological mapping, trenching and diamond drilling of 24 holes totalling 1990 m.

The company sank a 17 m shaft on the Tom vein. Underground drilling delineated 6 530 t with a grade of 14.4 g/t Au. Drilling done by Cominco totalled 1990 m in 24 holes.

In 1945, Cassidy Yellowknife Mines Limited acquired the property. During 1945 and 1946 the company drilled 10 125 m in 88 holes. Little work was done until Apex Energy Corporation purchased the TOM claims in 1984.

In 1985, Treminco Resources Ltd., in joint venture with Goldrich Resources Inc., acquired the property.

The area is underlain by complexly folded turbidites of the Burwash Formation (Fig. 2-2). Part of the Yellowknife supracrustal basin, the Burwash Formation overlies Kam Group volcanics to the west and is intruded by the Prosperous Lake Granite to the northeast of Tom Mine. The Tom deposit, a gold-bearing quartz vein, is hosted in amphibolite-grade turbidites within the contact metamorphic aureole of the Prosperous Lake Granite. Most of the gold-bearing quartz veins in the turbidite basin are hosted in greenschist-grade turbidites (Padgham and Brophy, 1985).

Four quartz veins have been drilled, however the only the Tom vein, also known as the No. 3 vein, has been mined.

The Tom vein trends roughly 100°, dips steeply and cuts bedding at a high angle. It is discontinuous, has been traced for 365 m and is up to 8 m wide. The Tom vein is truncated to the east by the Ptarmigan Fault.

Gold is free-milling, but erratically distributed in the quartz veins. The quartz vein contains less than 1% other minerals. The most abundant sulphide minerals are pyrite, sphalerite and galena; other minerals include arsenopyrite, chalcopyrite, pyrrhotite, native copper, tourmaline, feldspar, carbonate and scheelite. Sulphide-rich parts of the vein are not indicative of economic grade, but usually do contain gold (Brophy, 1987).

CURRENT WORK AND RESULTS

In September 1985, Treminco began to develop Tom Mine for production. A 170 m long decline was driven to a depth of 45 m to access the main ore block of the Tom vein. A 2720 t sample of ore was taken for metallurgical testing. The ore was custom-milled at nearby Giant Mine; recovery rate averaged 85%. Treminco plans to acquire a mill for its Tom and Ptarmigan mines. It expects that recovery will increase to 96%.

Tom Mine was brought into production in September 1986 using the shrinkage stoping mining method. Between February 1986 and July 1987, over 19 000 t of ore was treated at the Giant Yellowknife mill, producing roughly 140 kg of gold.

Tom Mine was developed by Treminco Resources to gain investor confidence to support Treminco's acquisition of the nearby Ptarmigan Mine. In 1987 Treminco negotiated an agreement to purchase the nearby Ptarmigan Mine from Cominco Ltd.

BULLMOOSE PROJECT

Terra Mines Ltd.	Gold
#202, 7608 - 103rd St.	85 I/7
Edmonton, Alta.	62°20'30"N,
T6E 4Z8	112°44'30"W

REFERENCES

Caine and Brown (1987), EMR (1989), Gibbins *et al.* (1977), Swatton (1985).

PROPERTY

TA 1-8, TER 1,2

LOCATION

The property is 80 km east of Yellowknife and 6 km west of Francois Lake.

HISTORY

The original TA group of 20 claims were staked in 1939 for the Consolidated Mining and Smelting Company. In 1940 and 1941, work consisted of trenching and drilling seventeen holes. An 18 m inclined shaft was sunk and 15 m of drifting and limited drilling tested the "No. 4" vein. A high grade-surface exposure of the "No. 1" vein was mined (Western Miner, June 1984) which produced 6.53 kg of gold from 10.9 t of material (Caine and Brown, 1987)

By 1961, twelve TA claims had lapsed and the eight remaining claims were transferred to W.L. McDonald. Visible gold was discovered; this showing was trenched and drilled in the following year (Western Miner, June 1984).

The property was acquired by Duke Mining Ltd. in 1967. Between 1967 and 1972, 3 632 m were drilled in 70 holes, showings were trenched and sampled and the stockpile from the old shaft was sampled (NMI 85 I/7 Au 1).

Terra Mining and Exploration entered a joint venture with Duke Mining in 1972 and by 1976 had earned 50% interest in the property by completing $200 000 of development work (Gibbins *et al.*, 1977). Work included nine diamond-drill holes totalling 390 m and 813 m of underground development. A 400 m northwesterly directed decline with a 15% grade was driven to -67 m to open up on the No. 4 vein. Drifting and cross cutting explored the -15 m and -20 m level and 2 400 t at an estimated grade of 13.7 g/t Au was stockpiled (NMI 85 I/7 Au 1). Drilling of the No. 4 vein indicated 34 g/t over a 1.8 m width and 90 m length (NMI 86 I/7 Au 1).

With the fall of gold prices in 1976, work was discontinued until 1981 when Terra Mines tested the No. 4 vein to a depth of 304 meters by drilling 1500 m from surface in 19 holes. Drill indicated reserves to 64 m depth were 25 000 t at 11.6 g/t Au (NMI 86 I/7 Au 1). In November, Terra Mines acquired the remaining 50% interest in the property through a successful takeover bid of Duke Mines Ltd.

In 1983, 3 336 m of surface drilling and 2934.7 m of underground drilling delineated 11 more auriferous veins, bringing the number of veins to 15. The decline was advanced 390 m and 500 m of drifting was completed, 75% of which was on veins on the -90 m level. The work indicated reserves to the -300 m level of 630 000 t grading 10.6 g/t (Terra Mines 1983 Annual Report).

DESCRIPTION

The claims are underlain by interlayered greywacke and argillites of the Burwash Formation. Rocks have been metamorphosed to nodular greywackes, phyllites and mica schists. On a property wide scale, Swatton (1985) identified domains of well bedded Bouma sequences, psammites and pelites forming an F_1 syncline with a possible hinge zone of an F_2 fold on the western limb. Swatton (1985) notes that higher grade quartz veins are on the southern limb of the F_2 anticline. Quartz

veins are parallel to enclosing strata and contain pyrite, arsenopyrite, scheelite, chalcopyrite, sphalerite, galena and silver. Gold forms fine blebs and fills fractures within the quartz veins and adjacent wall rock (NMI 85 I/7, Au1).

CURRENT WORK AND RESULTS

In 1984, 20% of the 5 400 ha property was prospected and mapped. The decline was enlarged to 3.4 m by 4.6 m to accommodate 15 t underground trucks (Terra 1984 Annual Report). By 1984, 27 veins had been discovered.

Surface geophysical surveys in 1985 detected coincident EM and magnetic anomalies along two major structures, thought to be faults or shear zones, adjacent to gold bearing veins (NMI 85 I/7 Au 1, Northern Miner, August 1, 1985). By the end 1985, geologic reserves had been calculated at 240 100 t grading 11.1 g/t Au (Terra 1985 Annual Report). At that time the company had stockpiled 45 500 t of ore at 4.5 g/t Au and 6 400 t at 13.7 g/t Au. Facilities in camp continued to be upgraded and by the end of the year included a 1524 m airstrip.

A modular 68 tpd test mill, constructed during 1985 and trucked to site along the winter road, began processing ore in April 1986 (Terra 1986 Annual Report). Up to 60% of the gold was recovered with jigs and the remaining flotation concentrate was shipped to Cominco's smelter in Trail B.C. for refining. No cyanide circuit was installed because of environmental concerns (Brophy, 1986 Exploration Overview).

At the end of April, total reserves from all categories were reported to be 255 000 t grading 10.6 g/t Au, based on a 1.2 m mining width and a 6.9 g/t cut-off grade (after NMI 85 I/7 Au1). By July, 47 kg of gold was produced from 3.6 kt of ore with an average head grade of 14.4 g/t Au (Brophy, 1986 Exploration Overview). One development heading was reported to average 12.7 g/t Au across 4.3 m over a distance of 19.8 m (Northern Miner 07/28/86). Mill test on ore from all areas of the mine indicated that the mill head grade was 72% of exploration grade (Terra 1986 annual report). The company decided not to proceed with production, citing risks associated with narrow vein deposits in remote locations and lack of significant tonnage per vertical foot.

Table 2-3: *Underground development at Bullmoose Mine, 1984 to 1986*

YEAR	DRILLING (m) *surface* **underground**	DECLINE ADVANCE (LEVEL m)	DRIFTS, SUBDRIFTS, CROSSCUTS	RAISING (m)
1984	*9 432.6* **5 852.7**	-163.4	2 063.0	882.0
1985	*1 524.4* **3 254.0**	-183.0	912.8	490.0 (Includes 78.6 m on Alimak raise)
1986	*2 918.3* **6 662.8**	-213.4 New decline advanced to -30.5	2 952.7	

Bulk sampling was completed in March 1987 and milling was completed by the end of June. Equipment, buildings and inventory were prepared for removal by ice road in 1988 (Terra Mines Ltd. 1987 Annual Report). Production between the years 1985-87 was 665 kg of gold from 49 400 t of material mined from 15 veins (EMR, 1989).

SALMITA MINE

Giant Yellowknife	Gold, Silver
Mines Ltd.	76 D/3
Bag Service 3000	64°04'30"N,
Yellowknife, NWT, X1A 2M2	111°14'26"W

REFERENCES

Dillon-Leitch (1981, 1984); Henderson (1944); Moore (1956); Ransom (1983); Ransom and Robb (1985)

PROPERTY

GIANT 1, JEJA 1-6, LT 1-3, LUFF 1-4, MAD 1-18, RED 24, REP 1-12, SALERNO 1-18, TOUGH 1-6, WIN 1-18.

LOCATION

Salmita Mine, on the east shore of Matthews Lake is roughly 240 km northeast of Yellowknife. A 1350 m gravel airstrip 3.7 km from the mine makes it accessible year round by fix-wing aircraft. In winter an ice road connects Salmita Mine to the Lupin ice road.

HISTORY

Frank Salerno staked SALERNO 1-18 in 1945. Salmita Northwest Mines Limited was incorporated that year to develop the property. LT 1-3 was staked in 1946. After Salmita Consolidated Mines Limited acquired the property in 1949, TOUGH 1-6 and LUFF 1-4 were staked.

In 1950, 17 690 t grading 16.46 g/t were outlined in the B vein. The zone is 105 m along strike by 1.4 m wide to a depth of 46 m.

A 44 m shaft was sunk on B vein in 1951. Exploration at the 38 m level included 35 m of crosscutting and drifting. A 90 kg bulk sample tested by the Mines Branch, Ottawa, contained 31.89 g/t Au and 9.77 g/t Ag. The property was optioned to Mack Lake Mining Corporation in 1954.

Bluebell Enterprises acquired the property in 1973 and optioned it to Giant Yellowknife Mines Limited in 1974. A decline was driven in 1975 to permit exploration from underground. Indicated reserves of 122 500 t grading 21.67 g/t Au were delineated to a depth of 183 m.

Giant Yellowknife Mines completed the purchase of Salmita property in 1980. A feasibility study in 1981 was followed by an underground exploration program during the summers of 1981 and 1982. Giant purchased the Tundra mill in 1982. Estimated cost of bringing Salmita to production is $13.9 million.

During 1983 the decline was driven from the 2nd to the 4th level, 205 m below surface. Levels were established at roughly

50 m intervals. Salmita mine was brought into production in July 1983 and the first ore was treated at the rehabilitated Tundra Mill in August 1983. In 1984 the decline was advanced to the 6th level.

DESCRIPTION

The area is underlain by the north-northwest-trending Courageous-Mackay Lake supracrustal belt (Fig. 2-3). Turbidites to the east conformably overlie, and are locally interbedded with the volcanics. Granitic rocks intruded the volcanics from the west. The volcanic belt is 65 km long and ranges from 1 to 5 km thick. Although it predominantly comprises mafic flows, there are two cycles of felsic volcanics in the sequence, one near the base and one at the top. Many of the gold-bearing quartz veins are associated with the upper cycle of felsic volcanics.

B-Vein, the main orebody at Salmita, is a gold-bearing quartz vein developed at the contact between an argillite unit and an overlying mafic volcanic unit. The vein trends north-northwest and dips 80° to 85°E. B-Vein is divided into South, Main and North shoots. The South and Main shoots are hosted in argillite and are separated by the Salmita shear zone. The shear zone does not transect the contact between the argillite and overlying mafic volcanics. The North shoot is the mafic volcanics.

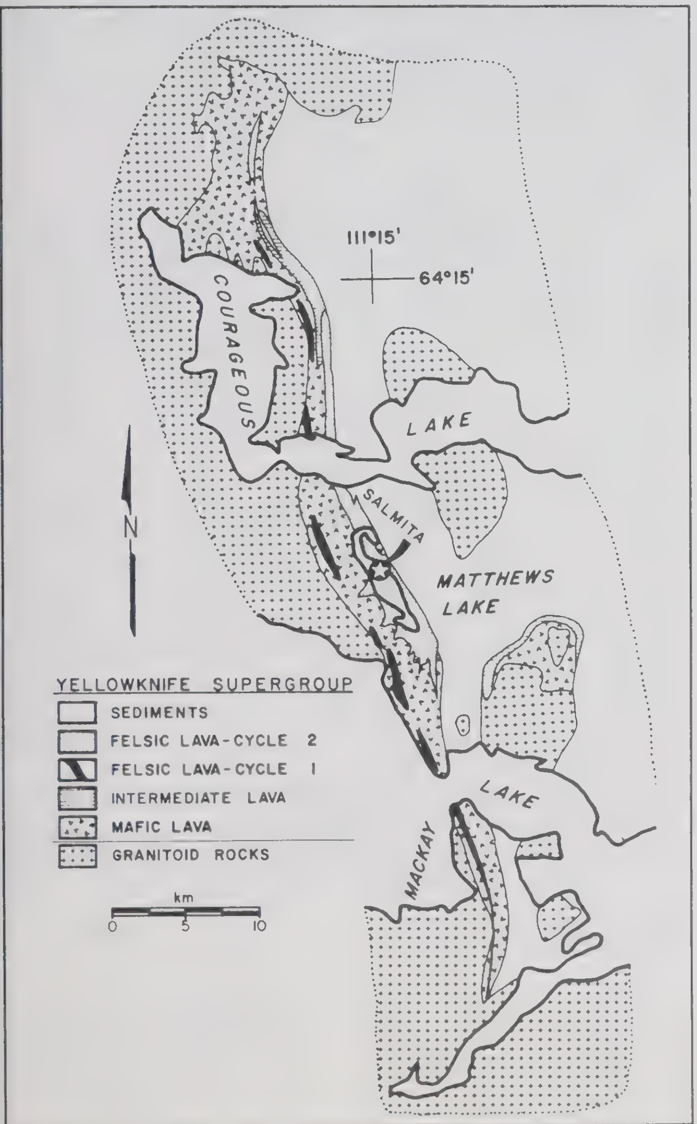

FIGURE 2-3: Simplified geology of the Courageous Lake-MacKay Lake volcanic belt (from Dillon-Leitch, 1981).

The South shoot, light-grey to white quartz with interbanded altered argillite, contains up to 1 to 2% pyrite and equal amounts of arsenopyrite. The South shoot has not been delineated below the 3rd level.

The Main shoot, the main gold-bearing structure of the deposit, is up to 4 m wide. The quartz vein varies in colour from light-grey to dark blue-grey to dark grey at depth. It is enveloped by an alteration zone of quartz, sericite, carbonate and sulphide-rich argillite that is more intense in the foot wall and narrows to the north.

The North shoot quartz vein is enveloped by arsenopyrite-rich, highly carbonatized and silicified mafic volcanics and has a maximum with of 3 m. Between the 2nd level and half way between the 3rd and 4th levels it comprises narrow high-grade zones. Above and below these levels the North shoot is too narrow and sinuous to be economic.

CURRENT WORK AND RESULTS

The ramp to the 7th level was completed in March 1986. An internal shaft from the 6th level to the 10th level, started in October 1985 was completed in May 1986. The lower ore zone between the 8th and 10th levels was developed through to August and was mined out by December 1986. The amount of ore below the 8th level was 50% more than expected based on drill information, but the grade was 36% lower than anticipated.

Gold recovery decreased from 98% in 1985 to 96% in 1986 because refractory ore from RED 24 was treated and included in the total amount of ore treated. Recovery rate for RED 24 ore was 75-78%. During its four years of production, roughly 5437 kg of gold were recovered from 204 144 t of ore for an average grade of 26.6 g/t Au.

Mining ceased in February 1987. By mid March the underground equipment had been removed and the mine was allowed to flood. Although most milling had finished by mid-April, 1905 t of ore recovered from the surface pad during site clean up was milled during July and August. The mill was closed in early September after a bio-leach test on ore from an open pit on RED 24, just north of the mine, was done by Giant Bay Resources.

Drilling on the Salmita, Tundra and RED 24 properties totalled 6736 m from surface and 3519 m from underground.

RED 24

Giant Yellowknife Mines Ltd	Gold
Box 3000	76 D/3
Yellowknife, NWT	64°06'N,
X1A 2M2	111°17'W

REFERENCES

Brophy, 1986; Ellis, 1988.

DIAND Assessment Report 080106; NMI 76 D/3 Au1.

PROPERTY

RED 24 claim

LOCATION

The RED 24 claim is immediately north of Matthews Lake, approximately 240 km northeast of Yellowknife.

HISTORY

The history for the area is summarized in the section on the Tundra Project in chapter 8. The RED 24 claim was staked in 1973 to cover ground previously held as the MC 5 claim, and acquired by Giant Yellowknife Mines. In the same year, the two drill holes totalling 268.3 m intersected sequences of rhyolite fragmental units and andesite. A 30 cm interval of rhyolite fragmental with quartz and pyrite assayed 1.37 g/t Au (assessment report 080106). Drilling on the RED 24 claim in 1983-84 outlined 12 700 t grading 19.5 g/t Au (NMI 76 D/3 Au 1).

DESCRIPTION

The claim is underlain by felsic flows and minor tuffs with thin interbeds of argillite, in contact with sediments at the eastern boundary of the claim and andesites at the western margin of the claim. Auriferous zones on the RED 24 are in the felsic volcanics adjacent to a diabase dyke. Grade decreases away from the dyke (Brophy, DIAND Property visit report, April 24, 1986). Samples taken from the RED 24 pit are described by Brophy (1986) as a layered felsic tuff containing up to 10% acicular arsenopyrite concentrated in layers and minor sulphides including pyrite, galena and sphalerite. Gold is associated with arsenopyrite rich layers.

CURRENT WORK AND RESULTS

Open pit work began on the claim in 1986. Four benches were mined yielding 5680 t grading 18.3 g/t Au (Giant 1986 Annual Report). Giant reported only 75-78% recovery for the refractory ore when treated in a conventional cyanide circuit. At the time it was not economically feasible to extract the remaining reserves of 7 250 t, available only from underground.

In 1987 Giant Yellowknife Mines entered into a joint venture with Giant Bay Resources Ltd. to carry out a test of Giant Bay Resources' Bio-tankleaching process on the RED 24 material. The joint venture agreement granted Giant Yellowknife Mines the exclusive rights to the bio-tankleach technology within a 10 km radius to the RED 24 deposit (NMI 76 D/3 Au 1). The bacteria used was *thiobacillus ferroxidous*, which consumes sulphides to produce less stable sulphates. After leaching, the gold was recovered in the cyanide circuit. A 10 tpd bio-tank leach circuit was added to Salmita's mill and operated during July and August treating 470 t at 25.2 g/t Au (Giant 1987 Annual Report). Recovery rates of up to 95.6% were achieved and a 9.67 kg dore bar was produced (Ellis, 1988).

LUPIN MINE

Echo Bay Mines Ltd.	Gold, Silver
3300 Manulife Place	76 E/14
10180 101 St.	65°46'N, 111°13'30"W
Edmonton, Alta., T4J 3S4	

REFERENCES

Bostock (1980); Gibbins (1981); Kerswill *et al.* (1983); King *et al.* (1988, 1989); Strachan and Moffett, 1985; Tremblay (1976).

PROPERTY

CONGO 1-9; 111 MOP claims; PAT 1-3.

LOCATION

Lupin Mine is on the southwest shore of Contwoyto Lake (Fig.2-4), roughly 400 km north-northeast of Yellowknife. It is serviced by a 1525 m gravel airstrip and a winter road. The 531 km winter road, connecting Lupin Mine and Yellowknife, is usually open from February to April.

HISTORY

A Canadian Nickel Company Limited (Canico) reconnaissance crew discovered the main showing in 1960. From 1961 to 1964 exploration included mapping, trenching, geophysical surveys and diamond drilling; 1.2 Mt of ore grading 17.14 g/t Au were outlined.

Canico optioned the property to Echo Bay Mines Limited in 1979, who purchased it in November 1980. Echo Bay drove a spiral ramp to a depth of 130 m and drilled 7000 m in 22 holes to a vertical depth of 200 m; reserves to a depth of 200 m were estimated to be 930 000 t grading 13 g/t Au at a cut off grade of 6.85 g/t Au. Surface facilities were constructed during 1981, 3050 m of drilling was done, and some development ore was stockpiled. By October 1982, a three compartment shaft had reached a depth of 370 m and four levels had been established. The mill, commissioned in April 1982, reached commercial production rate by October, 1982; the first gold brick was poured in May 1982. Underground exploration and development in 1982 increased proven and probable reserves to 3.13 Mt grading 13.58 g/t Au.

In 1983 mill capacity was increased by 20% to over 1100 t/d. In 1984, operating costs lowered as a result of a 50% expansion of the mill capacity, enabling the cut-off grade to be reduced. A three-year shaft-sinking project was started late in 1984.

DESCRIPTION

The Lupin area is underlain by complexly folded turbidites of the Contwoyto Formation which have been metamorphosed to upper greenschist facies (Fig. 2-4). Bostock (1980) distinguished Contwoyto Formation turbidite from Itchen Formation turbidite by the presence of scattered bands and lenses of silicate-, sulphide- and oxide-facies iron formation. Itchen Formation does not contain iron formation.

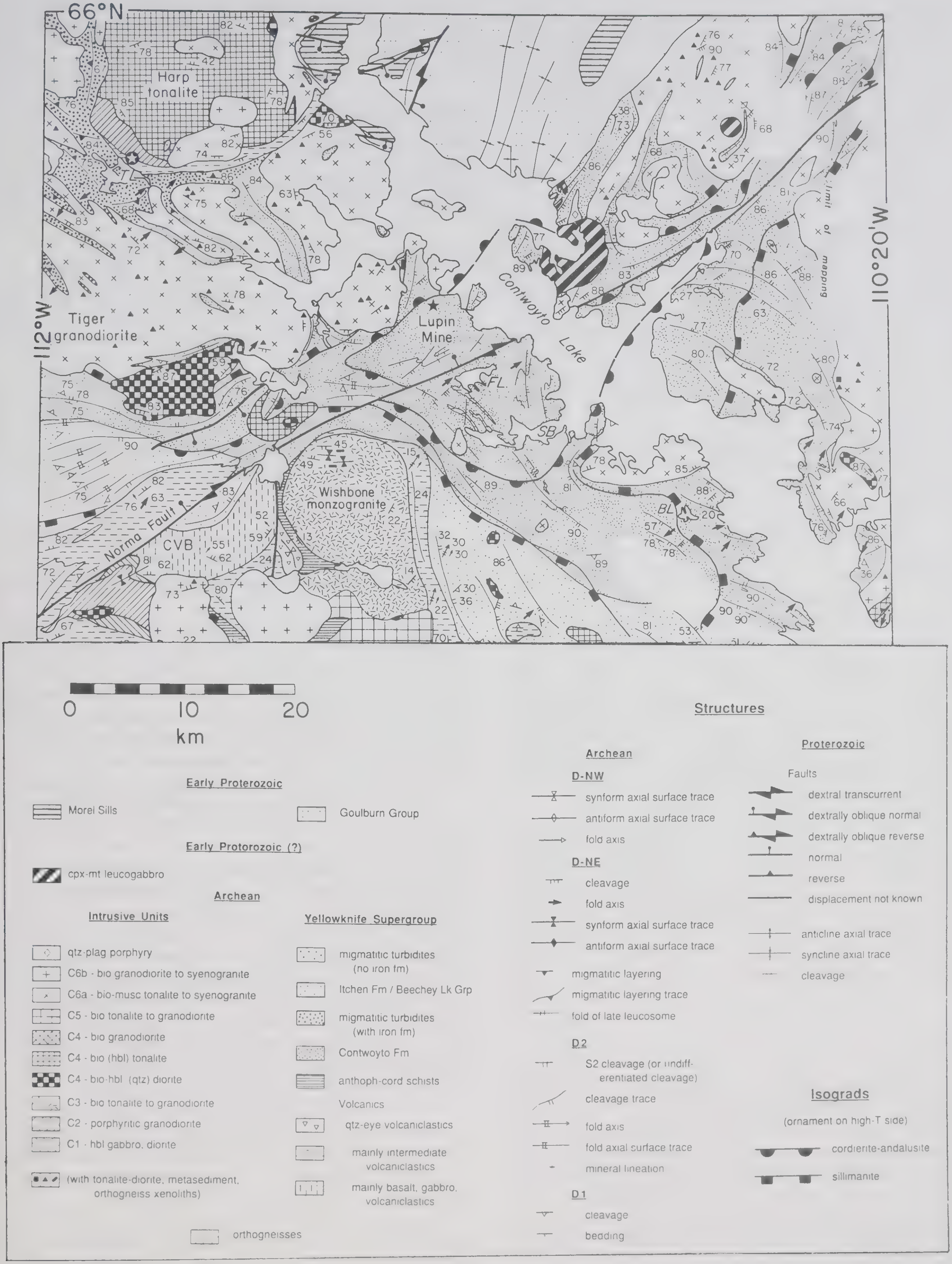

FIGURE 2-4: Regional geology of the Lupin Mine area (from King et al., 1989).

The Lupin deposit is a stratabound silicate-and sulphide-facies iron formation interbedded in a greywacke. The foot wall is quartzite, the hanging wall is phyllite. Contacts between the wallrock and the iron formation are usually well defined. The turbidites and interbedded iron formation have been tightly to isoclinally folded into a Z-shaped syncline-anticline pair. Fold hinges connecting these zones plunge roughly 75° to the northeast.

Free gold ranging in size from 5 to 50 μ is associated with fine-grained pyrrhotite, which forms fine laminations in the sulphide-facies of the iron formation. Gold is also found in inclusions along grain boundaries of arsenopyrite and loellingite. There are two distinct units in the iron formation: an auriferous sulphide-rich unit and a sulphide-poor silicate facies unit that contains very little gold. The sulphide unit contains more than 5% sulphides in thin bands, some of which can be traced for 16 m along strike, and comprises pyrrhotite, grunerite, quartz and feldspar and lesser amounts of arsenopyrite, loellingite and almandine. Gold is in the sulphide-rich iron formation. The sulphide-poor unit comprises hornblende, cummingtonite, grunerite and garnets.

A late system of quartz veins cross cut the structure at 65° to the strike of the Centre zone and increase in frequency in the fold nose areas. There are fewer of these quartz veins cutting the East zone. The late quartz veins are barren of gold, but have halos of loellingite and coarse-grained arsenopyrite. These quartz veins do not extend far into the wall rock and the bulk of the sulphides in the wallrock is associated with alteration halos around these late quartz veins.

The iron formation averages about 6 m wide, but has been thickened in places by minor folding. At the north and south noses of the Centre zone the iron formation is so tightly folded that the overall width is up to 25 m wide.

The Lupin deposit is divided into three main ore zones, coinciding with limbs of the folds: East, Centre and West zones. The East zone extends for 220 m along a northeasterly strike and varies in dip from 70°W near the south nose, through vertical to 70°N. Gold content decreases from surface to 330 m level; below 330 m level mineralized areas are not economic.

The Centre zone strikes northerly for 270 m, dips to the east at 70 to 80° and ranges in width from 5 m to 25 m. The Centre zone has maintained consistent tonnage and grade with depth.

The West zone has a strike length of 600 m and varies in width from 1 m to 6 m width. The dip of the zone varies from 80°W at the north nose through vertical to 80°E toward the southern limit of the ore zone.

CURRENT WORK AND RESULTS

During 1986, the shaft was deepened to 780 m. A development drift driven along the Centre Zone to the north fold on the 650 m level and diamond drilling confirmed that the Centre and West zones are similar in dimension and grade to those zones on the upper levels. In 1987, development on the levels between the 330 m and 650 m levels added 12 440 kg of gold to ore reserves. In late 1987 a new hoist capable of operating down to 1220 m was commissioned. Another shaft deepening project will commence in 1988, extending the depth of the shaft to 950 m.

Average daily milled through put continued to increase annually from 1555 t in 1985, to 1616 t in 1986, reaching 1686 t in 1987. Lupin produced 6009 kg of gold in 1986 and 6006 kg in 1987. Proven and probable ore reserves at the end of 1987 were 3.4 Mt with a grade of 11.38 g/t Au.

PINE POINT MINE

Pine Point Mines Ltd.	Zinc, Lead
c/o Cominco Ltd.	85 B/15,16
2600 - 200 Granville St.	60°50'50"N,
Vancouver, B.C. V6C 2R2	114°27'12"W

REFERENCES

Anderson and Macqueen (1982); Campbell (1967); Gibbins (1983); Jackson and Beales (1967); Kyle (1980); Macqueen and Powell (1983); Rhodes (1981); Rhodes *et al.* (1984); Skall (1975), Webb (1986).

PROPERTY

Pine Point property comprises 4 476 leased claims.

LOCATION

Pine Point, on the south shore of Great Slave Lake (Fig. 2-5), is connected by road to Hay River and is serviced by a 1370 m gravel airstrip. Freight and lead-zinc concentrate are transported by rail.

HISTORY

Claims were first staked in Pine Point area when prospectors travelling to the Klondike were directed by natives to sulphide showings on the south shore of Great Slave Lake. Because only minor amounts of precious metals were found, these claims were allowed to lapse.

Interest in the area was renewed during the 1920's. In 1929, Northern Lead Zinc Company, formed by Cominco Ltd. and Ventures Ltd., began to explore the area by drilling and trenching. Pine Point Mines Ltd. was formed in 1951 to acquire and explore the property. Cominco holds a 50% interest in Pine Point Mines Ltd.

Construction of a railway from Roma, Alberta to Pine Point commenced in 1962. The town of Pine Point was built between 1963 and 1965. Production from the open pits began in 1964. The first rail shipment, high grade ore averaging about 50% combined lead and zinc, left Pine Point in early 1965.

Pine Point acquired deposits from Pyramid Mining Co. in 1966, Coronet Mines Ltd. in 1972 and Conwest-Newconex Canadian Exploration in 1974.

Two main exploration tools used at Pine Point were IP surveys and diamond drilling. Since IP surveying was first used on the property in 1964, over 4000 km of IP surveys have been completed. Since 1948, over 600 km of drill core has been recovered from more than 10 000 holes.

The N81 deposit, discovered in 1981, was the third largest deposit found on Pine Point property, containing 2.7 Mt grading 21% combined lead-zinc.

Low lead and zinc prices in the early 1980's forced Pine Point Mines Ltd. to improve its operations by reducing production from

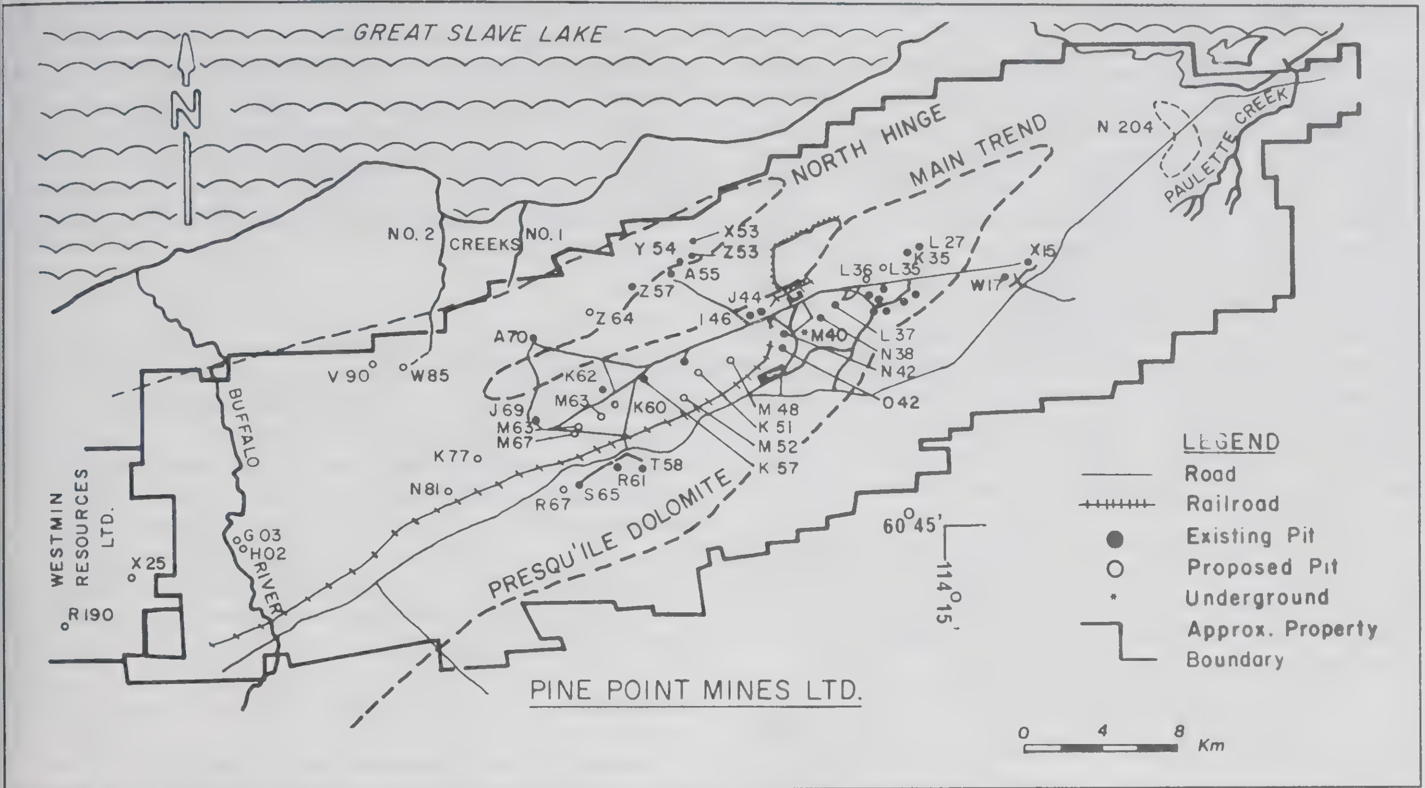

FIGURE 2-5: *Lead-zinc deposits in the Pine Point area (from Gibbins, 1983).*

lower-grade ore sources, reducing the operating time for the concentrator to five days a week and seeking temporary financial assistance from the federal and territorial governments. Higher prices for lead and zinc and improved productivity enabled Pine Point to return a profit in 1984.

Production at Pine Point has been mainly from open pits although underground mining was tested on M-40 deposit in 1973 and a deposit in the western part of the North hinge in 1986.

DESCRIPTION

Within the Pine Point property boundaries (Fig. 2-5) there are 87 deposits, 36 of which have been mined (Rhodes *et al.* 1984). These deposits are at several stratigraphic positions and range in size from 100 kt to 14 Mt. The orebodies are hosted by paleokarst features in a middle Givetian carbonate barrier complex. Lithofacies comprising these formations extend along a strike of 065° for at least 50 km. The Pine Point Formation, the lower two-thirds of the complex, is a very flat lensoidal accumulation of skeletal-derived carbonate muds and sands which have since been dolomitized. It attains a maximum thickness of 175 m at the axis of the barrier and thins to both the north and south.

The Sulphur Point Formation, a tabular biohermal to bioclastic carbonate buildup, conformably overlies the Pine Point Formation along the centre of the barrier, where it reaches its maximum thickness of 65 m. It thins, then ends abruptly on the northern edge of the barrier. It thins to 30 m on the south side of the barrier.

A coarse dolomite alteration, Presqu'ile dolomite, has replaced 60 to 70% of the Sulphur Point Formation on the barrier. The base of the Presqu'ile dolomite is near the contact between the Pine Point Sulphur Point Formation.

Pine Point Formation lies conformably on the Keg River Formation, a marine platform carbonate unit. Keg River Formation is a relatively homogeneous unit of grey-brown dolomite with carbonaceous-argillaceous wisps and partings hosting crinoid ossicles and thin to thick-shelled brachiopods. It is a laterally continuous extensive unit the underlies the Muskeg Formation of the Elk Point Basin and the Pine Point Barrier complex.

Orebodies are classified into two groups. Tabular deposits are flat-lying orebodies associated with a network of karst channels confined mainly to the lower limits of coarse dolomite alteration (Presqu'ile dolomite) at the base of the Sulphur Point Formation. Prismatic deposits are vertically elongate bodies, developed in areas of extreme karstification along the tabular karst system. More intense karstification usually occurs on structurally elevated areas. The average size of prismatic orebodies that have been mined is 1.4 t with a grade of 12% combined Zn-Pb.

Karst networks are developed along two main trends, the North and Main trends, which strike 065°, are coincident with two areas of preferential Presqu'ile dolomite development and are separated by a zone of undolomitized Sulphur Point Formation. Galena sphalerite, marcasite and pyrite are pervasive within the karst networks of the North and Main trends, replacing internal sediments and breccia fragments within the karst, filling open spaces and vuggy to interstitial porosity of the wall rocks, but often are not ore grade.

South Trend, a third mineralized area, is not a distinct trend like the Main and North trends. Prismatic orebodies on the South trend are similar to those found on the Main and North trends except for the apparent absence of tabular karst solution channels.

CURRENT WORK AND RESULTS

In December 1985, Pine Point Mines Ltd. announced a revised mining plan: an accelerated mining plan with the completion of mining in June 1987. By the end of the first quarter of 1986 mining had returned to full capacity and milling, which had been on a reduced schedule in 1985, resumed continuous operation. Production was mainly from six pits, but a small amount of high grade ore came from the underground mine in the western part of the North Hinge.

The test underground operation which began in 1985 was closed in late 1986 so that resources could be used in the N-81 pit. Although higher grade ore than anticipated were recovered from the underground mine, operating costs were high because the ore zone was narrow and the ground conditions were poor.

Mining of the N-81 pit progressed ahead of schedule despite the extensive dewatering required and was completed in the first quarter of 1987.

Exploration in 1986 and 1987 was concentrated on the eastern portion of the property where orebodies are more likely to be closer to surface, therefore having low strip ratios and low dewatering costs. A large, low grade mineralized structure containing a small ore-grade deposit was found.

The amount of ore milled increased from 2.1 Mt in 1985 to 2.9 Mt in 1986 to 3.1 Mt in 1987. At the end of 1987, 739 000 t of ore remained to be milled. Ore reserves for December 31, 1986 were calculated using metal prices forecast for 1987, roughly 8.3 Mt was removed from ore category. Reserves decreased from 13.6 Mt grading 6.3% Zn and 2.5% Pb at the end of 1985 to 3.4 Mt grading 9.6% Zn and 3.5% Pb at the end of 1986. Ore reserves at the end of 1987 were 640 t grading 10.4% Zn and 3.4% Pb.

Pine Point Mines Ltd implemented its abandonment plan. Abandonment and restoration work in the townsite and mining areas will be completed in 1988. Restoration of the millsite and tailings area will be completed in 1991 after all of the concentrate has been shipped.

NANISIVIK MINE

Nanisivik Mines Ltd.	Zinc, lead, silver
12th Floor, 20 Toronto St.	48 C/1
Toronto, Ont., M5C 2B8	73°02'30"N, 84°28'30"W

REFERENCES

Blackadar (1956, 1970); Brophy (1985); Clayton and Thorpe (1982); Curtis, (1984), Jackson and Iannelli (1981); Lemon and Blackadar (1963); Olson (1984)

PROPERTY

A claim, FISH 1-12, HB claim, 22 LION claims, LYNK 1-4

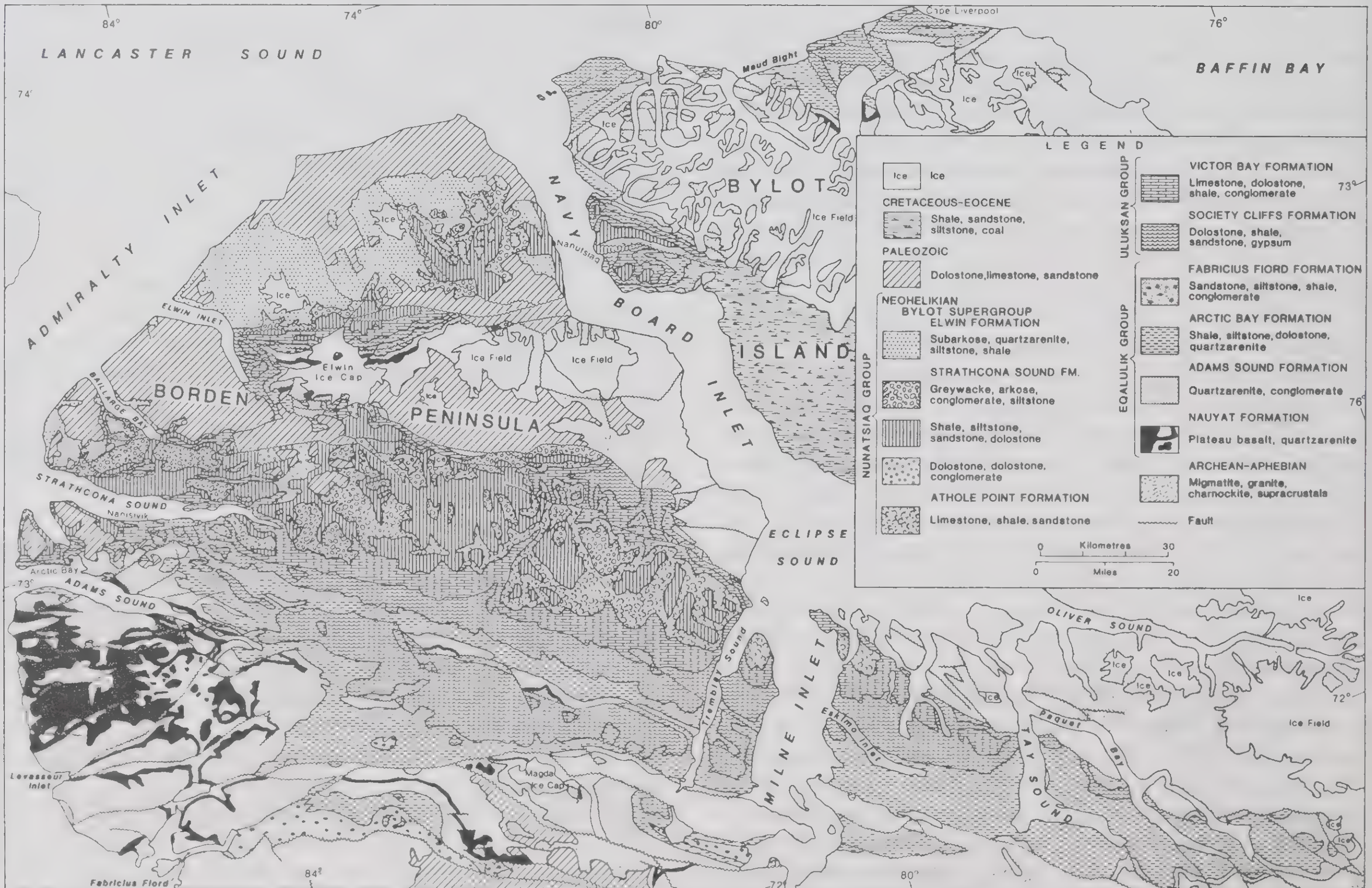

FIGURE 2-6: Regional geology of Borden Basin, northern Baffin Island (from Jackson and Iannelli, 1981).

LOCATION

Nanisivik, on the south shore of Strathcona Sound, on the Borden Peninsula of Baffin Island (Fig. 2-6), is connected by road to Arctic Bay, 27 km to the west.

The community is serviced by twice weekly jet from Montreal. A wharf was built on Strathcona Sound to handle ocean-going ships that transport lead and zinc concentrates to smelters.

HISTORY

In 1910, sulphide minerals were discovered in the Strathcona Sound area by a Dominion Government Expedition. Arthur English was the prospector who made the discovery. Two prospectors, J.F. Tibbett and F. McInnes travelled by dog team from Churchill Manitoba to staked claims in this area in 1937, but only had time to do a limited amount of work on these claims, which were allowed to lapse shortly after.

In his report on the geology of the Strathcona Sound area, Blackadar (1956) described pyrite zone roughly 40 m wide containing galena and sphalerite. The following year Texas Gulf Sulfur Co. Ltd. staked 15 claims that covered in part the eastern end of the Main Lens. Between 1958 and 1969 Texas Gulf Sulfur did geophysical surveys, drilled 30 500 m and collected a bulk sample from an adit driven into the east end of the orebody.

In 1972, the property was optioned to Mineral Resources International (MRI), who commissioned a feasibility study. A decision was made to bring the deposit to production. In 1974, Nanisivik Mines Ltd. was formed to operate the Mine and Strathcona Mineral Services was contracted to manage the project. Production began in September, 1976.

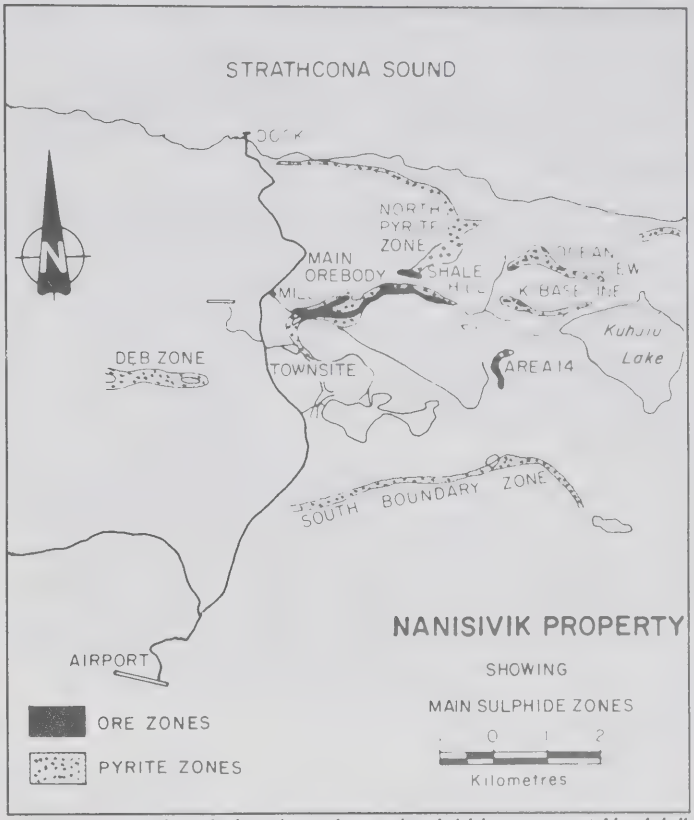

FIGURE 2-7: Lead-zinc deposits and sulphide zones at Nanisivik (from MRI annual report 1985).

DESCRIPTION

Nanisivik is on a major west-northwest trending graben whose long axis underlies and parallels Strathcona Sound (Clayton and Thorpe, 1982). Nanisivik, a lead-zinc-silver deposit, is hosted in Society Cliffs Formation dolomite, which outcrops along a 150 km belt extending from Tay Sound in the east to Admiralty Inlet in the west (Fig. 2-6).

The mine area is underlain mainly by Society Cliffs Formation dolomites, locally conformably overlain by Victory Bay Formation shales. The light grey to black dolomite contains algal laminae is light grey to brown and weathers brown.

Nanisivik is usually classed as a Mississippi Valley-type deposit although its age, geological setting, and high silver and iron content are atypical of Mississippi Valley-type deposits. The Nanisivik deposit is unusual in that it has a higher proportion of iron sulphide (pyrite and marcasite); a high silver content contained in the sphalerite; the host rock and ore are Precambrian in age; and it has high fluid inclusion temperatures.

The deposit comprises Main Lens and a lower Lens connected by a sub-vertical keel zone. The main lens is horizontal, roughly 3 km long, 60 to 120 m wide and 2 to 30 m thick. A diabase dyke crosscuts but does not displace the main lens.

Ore in the main lens comprises distinct layers of sphalerite, galena, pyrite and sparry dolomite gangue. There is very little galena in deposits other than the main lens. Silver is associated with the zinc not the lead, as is common. Silver content in the upper lens is constant along strike, roughly 55 g/t at 10% Zn. Silver content is lower in the central lower lens (30 g/t at 10% Zn) and east lower lens (20 g/t at 10% Zn).

There are four satellite deposits containing mainly pyrite and sphalerite and three massive pyrite zones in addition to the main orebody (Fig. 2-7).

CURRENT WORK AND RESULTS

In September 1986, Nanisivik Mines Ltd. became a wholly-owned subsidiary of MRI following MRI's purchase of the Government of Canada's 18% interest in the property.

Mining was completed in Area 14 deposit in 1986 and production started from Shale Hill and East Lower Lens deposits.

A decrease in production of lead concentrate from 1985 and an increase in silver reflect changes in sources of ore.

Four shipments of concentrate were made during 1986.

In 1987, roughly two thirds of ore milled came from the main lens, the remaining one third from satellite deposits. Silver production was lower than 1986 because of the low silver content of satellite deposits mined during the year. Lead production will continue to be low because satellite deposits being mined contain little galena.

Five shipments of concentrate were made between July and September, 1987.

POLARIS MINE

Cominco Ltd.
200 Granville St.
Vancouver B.C. V6C 2R2

Zinc, Lead
68 H/8
75°23'42"N, 96°56'00"W

REFERENCES

Drake and Keohane (1985); Gibbins (in press); Kerr (1977a, 1977b); Muraro (1973); Scales (1982).

PROPERTY

POLARIS 1-21

LOCATION

Polaris Mine, on the southwest shore of Little Cornwallis Island, is the world's most northerly base metal mine. Resolute Bay, 95 km to the southeast, has commercial jet service several times a weeks from Edmonton and Montreal; passengers and cargo are transported to the minesite by twin otter.

A wharf at the minesite on the Crozier Strait handles ocean-going ships during the 8 to 9 week shipping season.

HISTORY

Lead-zinc showings on Little Cornwallis Island were discovered by geologists working for Bankeno Mines Limited in 1960. The 21 POLARIS claims were staked that year. Exploration continued throughout the 1960's. In 1971, nine holes totally 1830 m were drilled on the Polaris property; all but one hole intersected lead and zinc minerals. Arvik Mines Ltd., owned by Cominco (75%) and Bankeno Mines Ltd. (25%), was formed to develop the lead-zinc deposit.

Underground development was done in 1972-73 to collect a bulk sample. Extensive underground drilling delineated reserves of 23.0 Mt grading 14.1% Zn and 4.3% Pb.

In 1979, Arvik Mines was dissolved and the orebody was turned over to Cominco, with Bankeno retaining a royalty option.

Polaris attained commercial production in March 1982. Primary mining of the Panhandle area was completed by March 1985. Mining operations shifted to the South Keel zone in 1985.

DESCRIPTION

The Polaris deposit is one of many Mississippi Valley-type deposits in the Cornwallis Lead-Zinc District (see chapter 4). The Cornwallis Lead-Zinc District corresponds to the northernmost part of the Cornwallis Fold Belt, which extends more than 650 km from the Precambrian Shield to the Sverdrup Basin (Kerr, 1977a). Thumb Mountain Formation, comprising limestone and minor dolomite, hosts all significant Pb-Zn deposits in the Cornwallis Lead-Zinc District. These stratabound deposits are hosted in brecciated dolomite and are close to overlying Cape Phillips Formation shale, which may have been the source for metals (Kerr, 1977b). The stratigraphy of the area is shown in Figure 2-8.

The Polaris deposit is hosted in dolomitized limestones of the Thumb Mountain Formation (Fig. 2-9). The Thumb Mountain Formation is overlain by green calcareous shales of the Irene

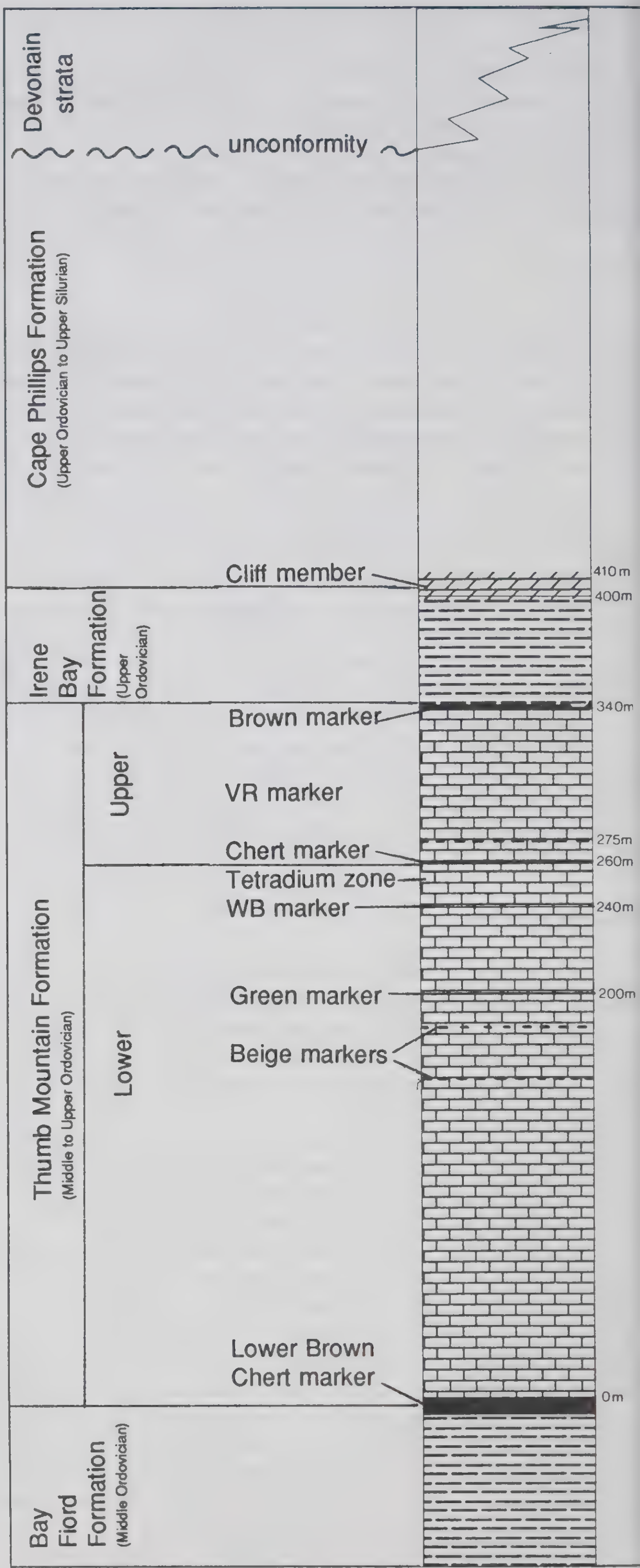

FIGURE 2-8: Stratigraphy of the Polaris deposit (from mine personnel).

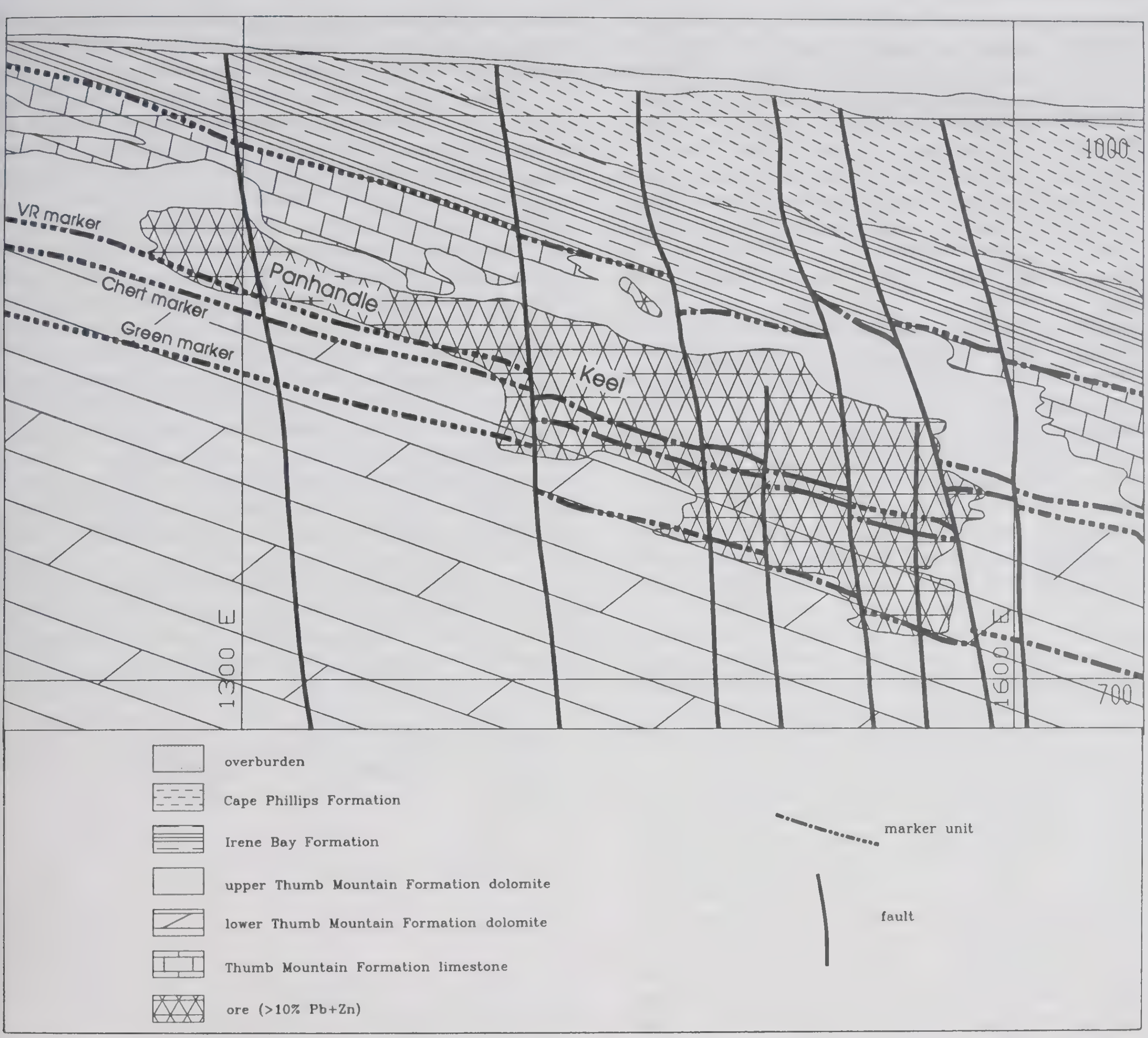

FIGURE 2-9: *Cross section through Polaris deposit, 2100N section (from mine personnel).*

Bay Formation, which are overlain by black bituminous dolomitic shales of the Cape Phillips Formation. Irene Bay Formation is characterized by very soft, incompetent, finely bedded sequence of green shales and shaly nodular limestone. The contact between the Thumb Mountain Formation and the Irene Bay Formation is defined by the Brown marker, medium to coarse-grained, brown mottled dolomite and occasional limestone, which is developed at the top of the Thumb Mountain Formation. Green shales, limestones and evaporites of the Bay Fiord Formation underlie the Thumb Mountain Formation.

The Thumb Mountain Formation is divided into upper and lower members. Upper Thumb Mountain Formation is characterized by coarse to sucrosic nodular dolomite and biomicritic limestone, with argillaceous sections near the top of the unit. Fossils include brachiopod fragments, gastropods, cephalopods, and rugose and tabulate corals. Contact with the lower Thumb Mountain Formation is moderately sharp and defined by the bottom of a zone of dark grey to black nodules, the Chert marker.

Lower Thumb Mountain Formation is characterized by a well bedded sequence of fine grained, brittle, sandy dolomites. The lower Thumb Mountain Formation, clean dense very fine grained to micritic dolomite and limestone, is capped by a 20-25 m thick fossiliferous unit, the Tetradium zone. Individual beds of dolomite range from 10 cm to 1 m in thickness and are generally separated by prominent 1 to 2 cm clay-rich bedding planes. The beds were fractured and brecciated in response to folding and dissolution of certain units. These fractures have been filled and healed by sparry dolomite stringers associated with sphalerite and galena mineralization.

A continuous correlatable stratigraphic unit, Green marker, is 60 to 65 m below the top of the lower Thumb Mountain Formation, near the base of the orebody. The Green marker is characterized by green fine-grained irregular-shaped blebs and

wisps in a dark grey to black breccia matrix.

The Polaris deposit is a north-trending east-dipping stratabound lens; a cross-section through the orebody is shown in Figure 2-9. The orebody has a strike length of 1 km and is open to the north and ranges in width from 100 to 400 m. The orebody is divided into two areas: Panhandle and Keel. The Panhandle, the thinner (5 m to 40 m thick) higher grade relatively shallow up dip section is west of a fault system on the west side of the Keel zone (Fig. 2-9). The Keel zone is the thickest, roughly 100 m thick, and deepest down dip extent of ore. The Keel area is sub-divided into the South Keel, Central Keel and North Keel.

Permafrost extends below the lowest mine workings to a depth of roughly 350 m below sea level. The porosity of the orebody is estimated to be about 5% (Scale, 1982); voids are filled with fresh-water ice. Mining techniques have been adapted for permafrost environment; the ground must remain frozen to maintain ground stability. The temperature of the rock ranges from -12°C near the surface to -4°C at the lowest developed area in the Keel zone (Drake and Keohane, 1985).

Ore minerals are colloform sphalerite and medium- to coarse-grained galena. Gangue minerals are sparry dolomite, marcasite (in P1 and P2 ore), ice and calcite. Ore is developed in the upper 140 m of the Thumb Mountain Formation. The host rock stratigraphy and lithology control and influences the type of mineralization (Gibbins, in press). Ore is divided into five groups based on a combination of mineralogy, structure and stratigraphic position. P1 and P2 ores are developed in the upper Thumb Mountain Formation and the K3, K2 and K1 ores are developed in the lower Thumb Mountain Formation.

P1 ore, the highest grade ore, containing between 15 to 30% Zn, comprises colloform sphalerite, crystalline galena and fine-grained green marcasite. P1 ore is a tabular body that forms the Panhandle zone and caps the Keel zone. It is only type of ore in the Panhandle area. P1 ore approximately follows, but gently transgresses down across the bedding plane of the Upper Thumb Mountain rocks which dip at 20°E throughout the mine area. P2 ore comprises sub-vertical veins and stringers and to a lesser extent bedding parallel veins and breccia. P2 ore is developed above P1 ore, but only in the Keel area where ore is developed below P1 ore. P2 ore has not been found in the Panhandle area of the mine.

K1 to K3 ore is a network of galena/sphalerite veins and irregular masses that underlies the eastern portion of P1 ore. K3 ore, a tabular unit comprising both colloform and crystalline sphalerite and medium to coarse-grained galena, is developed in the upper 25 m of the lower Thumb Mountain Formation. Lenses of Tetradium coquina have been preferentially replaced *in situ* by sulphide minerals. K2 and K1 ore comprise vertical chimneys and stringers, disseminated sulphides and breccias. K1 ore, the lowest stratigraphic ore zone is developed both above and below the Green marker near the base of the Polaris deposit.

CURRENT WORK AND RESULTS

The Polaris deposit is mined using sublevel blasthole stoping in primary stopes. Primary mining of the Panhandle area was completed in early 1985. Pillar recovery began in the fall of 1985, and the first pillar had been removed by September 1986. Pillar recovery is expected to be roughly 80% (personal communication, mine staff). The Keel zone continued to be developed and mined during 1986 and 1987. Diamond drilling tested the Keel zone for southern extensions.

Grades for both lead and zinc concentrate were high than previous years because of improvements made to the mill. The grade for zinc in concentrate was 62.8% in 1986 and 62.5% in 1987, up from a high of 61.8% in 1985. The grade for lead in concentrate was 78.4% in 1986 and 79% in 1987, up from 76.2% in 1985.

In 1986, 886 000 t of ore was milled, down from 939 000 t in 1985, because of a six week shut down to control concentrate inventory levels. A record high of 983 800 t of ore was milled in 1987.

In 1986, Polaris produced 182 100 t of zinc concentrate containing roughly 114 360 t of zinc, and 32 000 t of lead concentrate containing roughly 25 088 t of lead. In 1987, 206 100 t of zinc concentrate containing roughly 128 812 t of zinc, and 33 600 t of lead concentrate containing roughly 26 544 t of lead were produced.

Since production began in 1982, 1 099 300 t of zinc concentrate containing 674 690 t of zinc and 234 500 t of lead concentrate containing 179 100 t of lead has been recovered from 4 926 900 t of ore.

To account for lose of ore in pillars, reserves were decreased by 2 721 600 t in 1987. Reserves at the end of 1987 were 15 060 000 t at 14.4% Zn and 3.9% Pb,which provide for 16 years production at current production rates.

CANTUNG MINE

Canada Tungsten Mining Corp. Ltd.	Tungsten 105 H/16
P.O. Box 9	61°57'45"N,
Tungsten, NWT, X0A 0A0	128°15'W

REFERENCES

Cummings and Bruce (1977); Gabrielse and others (1973); Mulligan (1984); Skinner (1961)

PROPERTY

AC 1-7, BC 1-8, 10-11, CED 1-49, 59-65, 67-73, EF 2, 5-8, RL 1, 3-5, 8-10, 19-20, WO 1-11

LOCATION

Cantung Mine, on the southwest side and near the head waters of the Flat River (Fig. 2-10), is roughly 3 km from the Yukon border. A 306 km all-weather gravel road connects Tungsten to Watson Lake, Yukon. A 1220 m gravel airstrip services the community.

HISTORY

The Pit orebody was discovered by Axel Berglund in 1954. He was prospecting for Northwestern Exploration Limited and staked it as a copper prospect. The deposit was mapped and sampled and the area was mapped in 1955. After 7 holes were drilled in 1956, it was determined that both size and grade were

sub-economic for a copper deposit.

During the late 1950's, prospectors working for the Mackenzie Syndicate discovered scheelite while panning on the Flat River. Meanwhile the showing had been drilled by Kennecott Copper. The company, not finding a suitable grade or size for a copper deposit, allowed the claims to lapse in the fall of 1958. The Mackenzie Syndicate immediately restaked the ground as the WO claims.

Early in 1959 the showing was sampled and the Canada Tungsten Mining Corporation Limited was formed to acquire and develop the property. Extensive surface work and diamond drill during 1959 and 1960 outline 1 067 230 t of indicated ore reserves grading 2.47% WO_3.

In 1961 a 25 m exploratory adit was driven and 95 m of drifting explored the orebody. A 270 t/d plant was built. An all-weather road connecting the mine to Watson Lake was completed in 1962.

Original plans called for extraction of the Pit orebody using underground mining methods. In 1967 the reserves were recalculated based on using only open pit mining methods.

In 1971, the life of the mine was extended when exploration drilling intersected a skarn zone 550 m north and 240 m lower than the Pit orebody. Drilling to test the discovery continued in 1972. In the fall a production size adit was advanced 133 m to enable exploration of the 'E' zone orebody.

In 1973 upon verification of E-zone orebody by diamond drilling a decision was made to take only higher grade skarn ore from the open pit and to develop the E-zone for production. After remaining open pit ore had been milled, the mill was converted to process E-zone ore. Ore from underground started

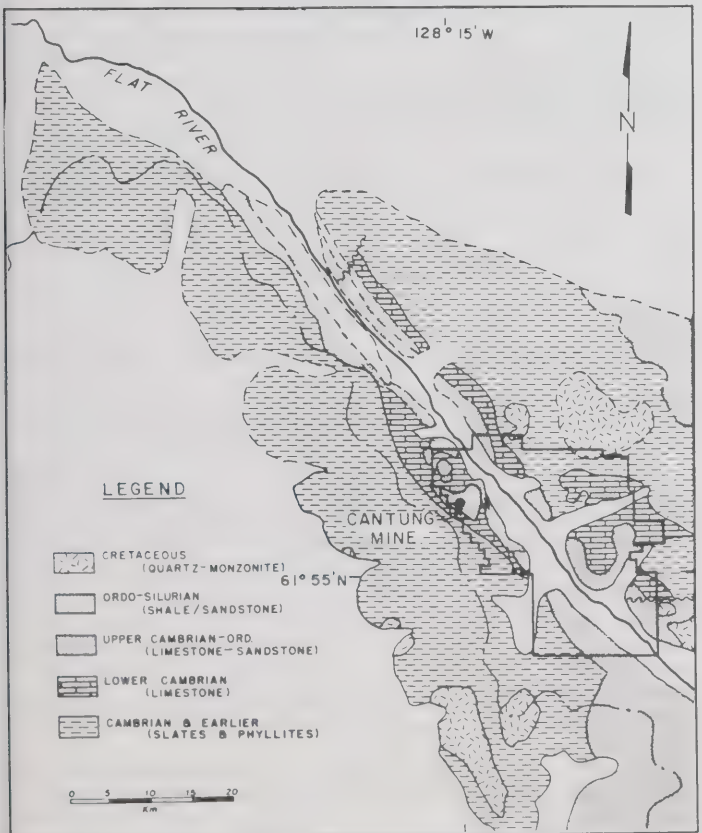

FIGURE 2-10: *Regional geology, Cantung Mine area (from Gabrielse and others, 1973).*

to be milled in mid-June 1974.

Because the E-zone is not as competent in the western part, bulk mining using large diameter blast holes was introduced in 1984 (Brophy, 1987). Room and pillar mining method had been used in the eastern portion of the orebody.

In 1985, a new management team was organized and a revised mining plan was completed by J.S. Redpath Ltd. Based on the work of J.S. Redpath and the Cantung engineers, the estimate of mineral ore reserves was reduced by almost 50%.

DESCRIPTION

The area is underlain by a thick series of sedimentary rocks ranging in age from late Precambrian to Upper Cambrian. In the Flat River area the Cambrian sediments grade from quartzite and dolomite in the northeast to shale an argillite with minor carbonates in the southwest. Several granitic stocks have intruded the sediments. All tungsten showings in this area are associated with the metamorphic aureoles developed around the granitic intrusions.

The dominant structure in the area is a northwest-trending syncline. The Flat River flows through the trough of the syncline. The sedimentary rocks on the southwest limb of the syncline have been folded into overturned small tight folds. A quartz-monzonite stock, the 'Mine stock' intruded the sedimentary sequence during the Cretaceous, altering the limestone to skarn.

Ore-bearing skarns are hosted in two distinct units: Ore limestone and Swiss cheese limestone. Ore limestone a blue-grey finely laminated recrystallized limestone or marble unit, roughly 60 m thick, hosts 'skarn ore'. Swiss cheese limestone a dolomitic siltstone containing pods and lenses of impure limestone, hosts 'chert ore'.

Two deposits have been mined at Cantung (Fig. 2-11). The Pit orebody in the floor of a cirque at an elevation of 1524 m and the E-zone orebody at an elevation of 1220 m and roughly 550 m north of the pit zone.

The main zone of Pit orebody, not including chert ore, was roughly 200 m long, 90 m wide and 20 m thick. The orebody is cut by a fault on the south side and dips northward and pinches out with no structural cause (Cummings and Bruce, 1977). The Pit orebody, developed in both Ore limestone and Swiss Cheese lime-stone, comprises diopside-hedenbergite-garnet skarn with quartz, calcite, scheelite, microcline, and locally abundant pyrrhotite.

The E-zone is an east-trending lens over 820 m long roughly 12 m thick and with a slope width of 150 m. It dips on average 20° south. Ore terminates where it is truncated by the underlying intrusive and where the Ore Limestone thins out. The E-zone, which is developed only in the Ore Limestone, has less pyroxene-garnet skarn than the pit orebody, but has abundant pyrrhotite. Amphibole is in fractures in the lower part of the zone and in bands with pyrrhotite and scheelite. Biotite is in the lower part of the skarn near the granite contact. Scheelite-bearing quartz veins cut both E-zone and Pit orebody skarns.

The differences between the mineralogy of the two deposits are due to the positions of the orebodies relative to the Mine Stock. The E-zone underwent more intense metasomatism of its proximity to the contact with the underlying granite (Mulligan, 1984).

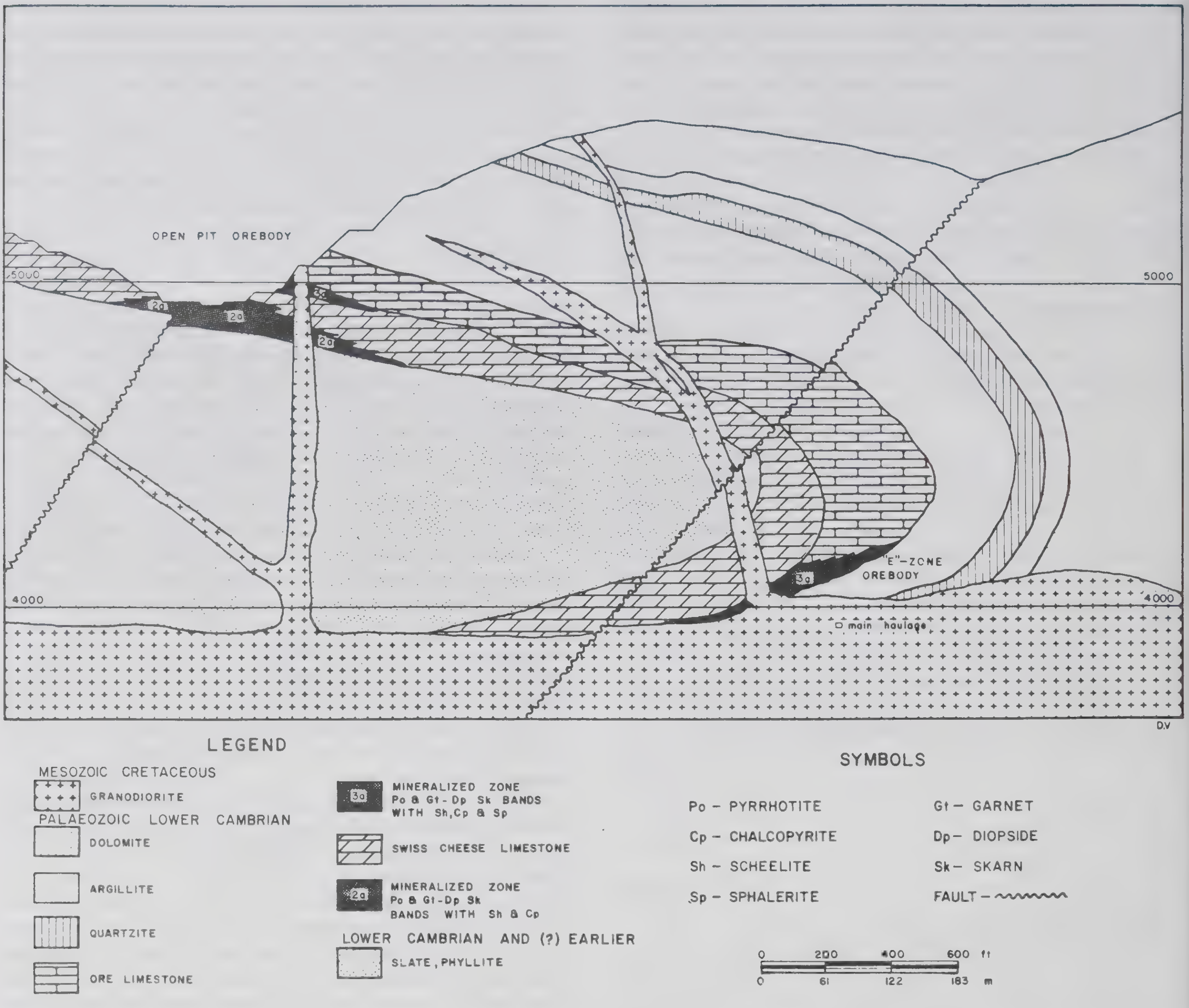

FIGURE 2-11: *Cross section through Cantung Mine area showing the Open pit and E-zone orebodies (after Cummings and Bruce, 1977).*

CURRENT WORK AND RESULTS

In May, 1986, a strike force halted operations at Cantung; operations at Canada's only tungsten mine were suspended indefinitely in August 1986 because of depressed tungsten prices. The price for scheelite dropped from US$84/STU in 1984 to US$50/STU in 1986. The mine may reopen if the price increases and the market for tungsten shows stability.

Since 1962, a roughly 15 133 665 t of ore have been mined from the two orebodies: 1 221 245 t of ore from the pit and from 2 912 420 t of ore from underground. The E-zone has yielded 3 818 115 STU WO_3, containing roughly 27 470 t W.

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CHAPTER 3
CORDILLERAN DISTRICT

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INTRODUCTION

The Cordilleran District extends from the Beaufort Sea south to the B.C. border and from the Yukon border to Great Bear Lake and Great Slave Lake (Fig. 3-1). It is subdivided into the Mackenzie Platform and the Selwyn Basin (Fig. 3-2). Selwyn Basin and Mackenzie Platform west of Mackenzie Arch comprise the Cordilleran miogeocline, a prism of sedimentary rocks of Precambrian to Jurassic age deposited along the relatively stable continental margin of North America (Abbot *et al.*, 1986).

Selwyn Basin represents part of the outer miogeocline (Cecile, 1982). Mackenzie Platform represents the inner miogeocline. The transition from platformal limestone to basinal carbonaceous mudstone and chert is diachronous.

Sedimentary sequences of the miogeocline are grouped (Abbot *et al.*, 1986):

1. Late Proterozoic Windermere Supergroup, a westward thickening wedge of clastic sediments, the lower part of which, at least, reflects deposition along a newly rifted margin of western North America (Young *et al.*, 1979). Mineral deposits (Table 3-1) include stratabound-Redstone copper belt and the Crest iron deposit.
2. Early Cambrian to Middle Devonian westward thickening, shallow water clastic rocks and shelf carbonates of the inner miogeocline and thinner, deep water, clastic dominated strata of the outer miogeocline. Passive sedimentation was interrupted by periodic extensions marked by unconformities and volcanics. Mineral deposits of the inner miogeocline are carbonate-hosted stratabound zinc-lead deposits, such as the Gayna River and Bear-Twit deposits, and silver-lead-zinc vein deposits filling fractures and faults, such as the Cadillac Creek deposit; and of the outer miogeocline are shale-hosted zinc-lead deposits, such as the Howards Pass deposit.
3. Middle Devonian and Mississippian transgressive westerly derived clastics: coarse-grained in the outer miogeocline, Lower Earn Group; and, fine-grained in the inner. Mineral deposits include stratiform sediment-hosted zinc-lead (silver-barite) deposits, such as the Jason and Tom deposits and barren barite deposits (Abbot *et al.*, 1986; Lydon *et al.*, 1985).
4. Mississippian to Triassic stable, marine, shallow water clastics which host barren barite deposits, such as the TEA deposit (Abbot *et al.*, 1986; Lydon *et al.*, 1985). Platformal strata also include marine coal-bearing sequences (Reindeer Formation and Coal-bearing division, Table 3-1) and non-marine coal sequences (Moose Channel Formation) (Long, 1986).

Sedimentary sequences of the Cordillera in the NWT are variably and polydeformed. This reflects repeated and complex accretion further to the west of allochthonous terranes with the North American craton between Devonian and Tertiary time (Monger *et al.*, 1972). In the western NWT, rocks may be folded, thrusted, rifted and offset by strike-slip faulting to form the Mackenzie Fold Belt (Douglas *et al.*, 1970). Mid-Cretaceous granitoid intrusives of the Selwyn Plutonic Suite (Anderson, 1982, 1983) were emplaced following an episode of collision, the Laramide Orogeny, and are associated with tungsten skarns, including MacTung and Cantung (Table 3-1). East of the Mackenzie Fold Belt, rocks of the Mackenzie Platform are relatively undisturbed (Macqueen, 1976).

Exploration in the NWT Cordillera was low, due in part to depressed commodity prices for lead, zinc, tungsten and copper during 1986 and 1987. Tungsten prices declined from (US) \$68/STU in 1985 to \$43/STU in 1986 to \$31.42/STU in 1987 resulting in closure of Canada Tungsten Mining Corporation's Cantung Mine on August 12, 1986. Canada Tungsten continued to ship concentrate from its stockpile during 1987. Canada Tungsten's MacTung deposit (176 km north of Cantung Mine), acquired in 1986 from its principal shareholder, AMAX Inc., was placed on caretaker status due to the continued decline. Surface exploration work was not done on either of these properties during 1986 and 1987.

There were 2014 claims (78 978 ha) in good standing in the Cordilleran District at the beginning of 1986. By the end of the year, no new claims had been staked, and 55 claims (5174 ha) had lapsed. In 1987, 19 new claims (460 ha) were staked and 688 more claims (17 084 ha) lapsed. Thus, there were 1290 (57 031 ha) claims in good standing at the end of 1987.

Seven reports were submitted documenting representation work for the 1986-87 time period (\$38,468.35 in 1986 and \$118,398.57 in 1987). Also summarized are: one report on 1985 work which was submitted after the 1984-85 Mineral Industry Report was written; previously undocumented 1981 and 1982 work on several Coal Licences; and, 1970 work on a vanadium showing. Prospector Eric Schultes excavated 15 cubic yards of overburden, gravel and rock during 1987 on the KE 1 claim in the Caribou River area (95 D/15) while exploring for gold.

The descriptions of properties that follow are listed by metal commodity and geological environment as follows: carbonate-hosted lead-zinc deposits; tungsten associated with skarn deposits; gold; coal; and, vanadium.

CARBONATE HOSTED ZINC-LEAD DEPOSITS

Carbonate-hosted open-spaced zinc-lead deposits in the Mackenzie Platform are in Proterozoic to Upper Devonian strata. The majority of the significant deposits in the Mackenzie Mountains are in dolomites of Lower Cambrian age. The deposits follow the trend of the Lower Paleozoic strata for 362 km along the Mackenzie Fold Belt (Dawson, 1975). Zinc occurs as pale sphalerite, and commonly predominates over lead by about 10:1. Silver and iron content of the deposits is low. Pyrite and pyrobitumen are minor constituents, and gangue minerals include sparry dolomite, calcite, quartz and barite. Secondary zinc-lead minerals, notably smithsonite, are developed in higher ridge-top showings that escaped glaciation (Dawson, 1975).

Numerous deposits show features similar to those of Mississippi Valley-type deposits: simple mineralogy; low precious metal content; limestone or dolostone host rock; shallow depth of formation; and, solution features, such as the

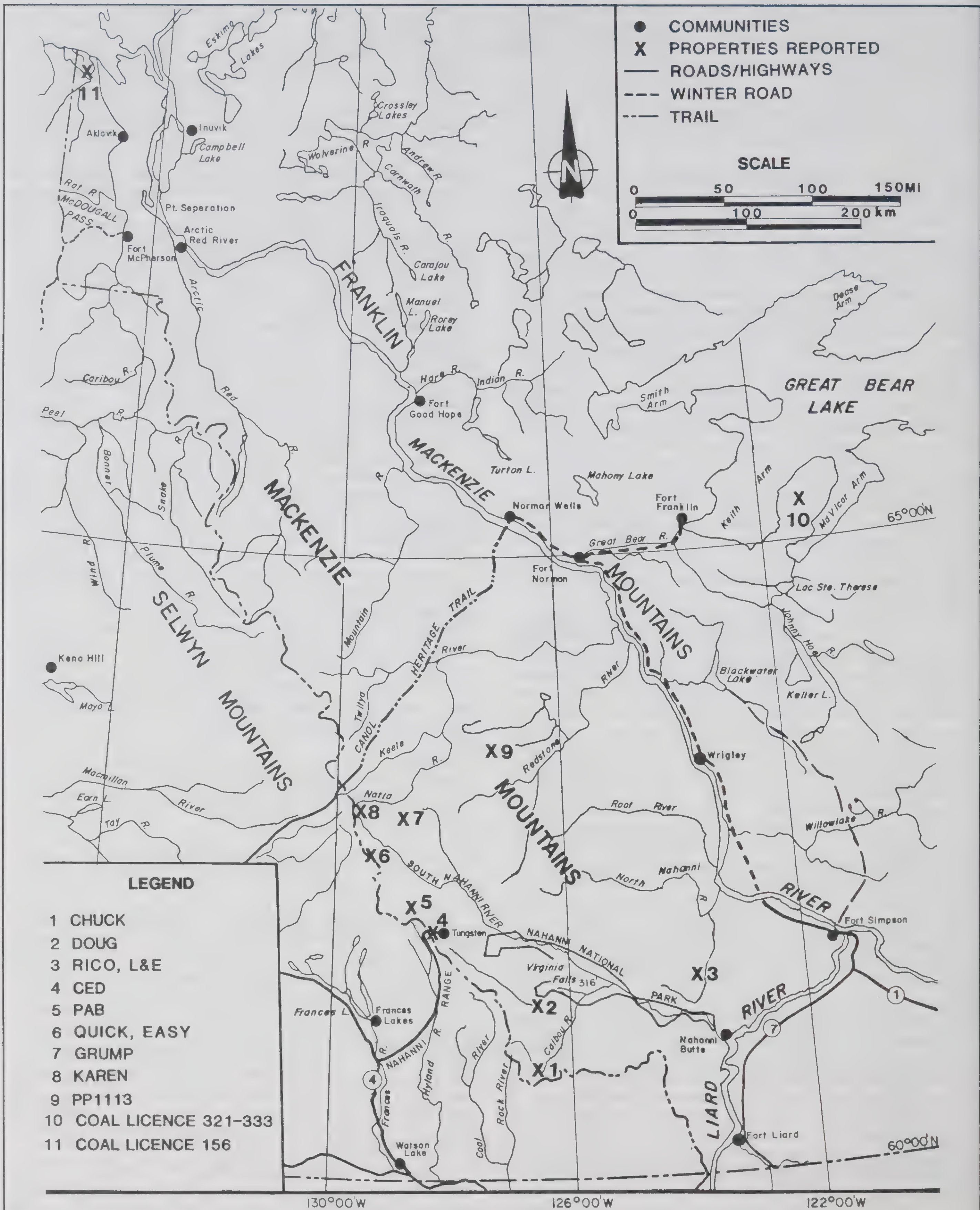

FIGURE 3-1: Properties explored in the Cordilleran District, 1986-1987.

TABLE 3-1: MINERAL DEPOSITS IN THE NORTHERN CORDILLERA

NTS	DEPOSIT	TYPE	HOST ROCK & AGE	RESERVES	REFERENCE
95 L/10	Coates Lake (Redstone Copper Belt)	Sabkha-type sedimentary stratabound copper	Coates Lake Group; Proterozoic	37 Mt*1 at 3.9% Cu 11.3 g/t Ag	Jefferson, 1983 Jefferson & Ruelle, 1986 NMI Card
106 F/2, 3,6,7	Snake River (Crest Deposit)	Jasper-hematite iron formation	Rapitan Group (Ekwi Supergroup); Proterozoic	18 Gt at 46% Fe, 0.3% P_2O_5	Yeo, 1986
106 B/15	Gayna River	Carbonate-hosted open-spaced Zn-Pb	Little Dal Group; Proterozoic	50 Mt*2 at 4.7% Zn, 0.3% Pb	Abercrombie, 1978 Brock, 1976 NMI Card
106 A/3	BEAR-TWIT (Godlin Lakes)	Carbonate-hosted Zn-Pb(Ag)	Whittaker Formation; Ordovician	9.07 Mt*1 at 5.4% Zn, 2.6% Pb	Gabrielse *et al.*, 1973 DIAND assessment report 080594 NMI Card
95 F/10	Cadillac Vein (Prairie Creek)	Ag-Zn-Pb veins in a brecciated fracture zone	Whittaker Formation; Ordovician	2.14 Mt*3 at 13.5% Zn, 10.9% Pb, 191.32 g/t Ag, 0.52% Cu, 0.087% Cd	Morrow & Cook, 1987 Northern Miner, 1982
105 I/6	Howards Pass (Summit Lake)	Sediment-hosted stratiform Zn-Pb (Ag-barite)	Road River Formation; Ordovician-Silurian	59 Mt*1 at 5.4% Zn, 2.1% Pb	Brock, 1976 Goodfellow & Jonasson, 1986
105 O/1	Tom (MacMillan Pass)	Sediment-hosted stratiform Zn-Pb (Ag-barite)	Lower Earn Group (Tom East, Tom West Zones); Middle-Upper Devonian	10.8 Mt*3 at 7.54% Zn, 6.37% Pb, 73.7 g/t Ag	Carne, 1979 Goodfellow & Jonasson, 1986 McClay & Bidwell, 1986
105 O/1	Jason (MacMillan Pass)	Sediment-hosted stratiform Pb-Zn (Ag-barite)	Lower Earn Group; Middle-Upper Devonian	15.5 Mt*4 at 7.09% Pb, 6.57% Zn, 79.9 g/t Ag	Bailes *et al.*, 1986 Goodfellow & Jonasson, 1986
105 H/16	Cantung	Scheelite-bearing chalcopyrite-pyrrhotite-sphalerite skarn W-Cu(Zn)	Paleozoic limestone (Ore Limestone, Swiss Cheese Limestone) altered by Cretaceous monzonite intrusions	1.4 Mt of 1.20% WO_3 0.97 Mt of 0.66% WO_3	Dick & Hodgson, 1982 NMI Card
105 O/8	MacTung	Scheelite, pyrrhotite and minor chalcopyrite in pyroxene-garnet skarn	Paleozoic limestone (Lower Zone, Upper Zone) altered by Cretaceous quartz monzonite stocks	32 Mt at 0.92% WO_3	Atkinson & Baker, 1986 Dick & Hodgson, 1982 NMI Card
107 B/4	Aklavik Coal Mine (Donna River)	Coal seams	Coal-bearing division (Unit Kwc of GSC map 1517A); Lower Cretaceous	Sub-bituminous A (12 240 BTU)	Jeletzky, 1975, 1959 Long, 1986, NMI Card Norris, 1981
117 A/9	Coal Mine Lake	Coal seams	Reindeer Formation (Aklak Member); Tertiary	517 Mt of Bituminous C to Sub-bituminous A	Long, 1986 NMI Card

*1 drill indicated
*2 possible
*3 proven, probable and possible
*4 inferred, indicated

Gayna River deposits, are confined to margins of algal 'patch reefs' within the Proterozoic Little Dal Group (Brock, 1976), a stromatolitic and algal laminated dolomite separated by thick developments of massive, vuggy, recrystallized dolomite (Abercrombie, 1978). The carbonate reefs are bounded by gypsum evaporites and shales of shallow water origin (Brock, 1976). The Gayna River deposits are estimated to contain in excess of 50 Mt of ore grading 4.7% Zn and 0.3% Pb (National Mineral Inventory Card File).

Many deposits in the Mackenzie Platform, however, are high-grade low-tonnage Cretaceous to Tertiary silver-zinc-lead veins which suggests that many of the showings termed Mississippi Valley-type are in fact tectonically related to one or more of the orogenies affecting these rocks (Lord, 1984). The Cadillac Vein (Prairie Creek) deposit, hosted by Ordovician Whittaker and Silurian Road River formations, is estimated to contain 1.45 Mt grading 12.17% Zn, 11.16% Pb, 185.14 g/t Ag, 0.44% Cu and 0.087% Cd (Northern Miner, 1982).

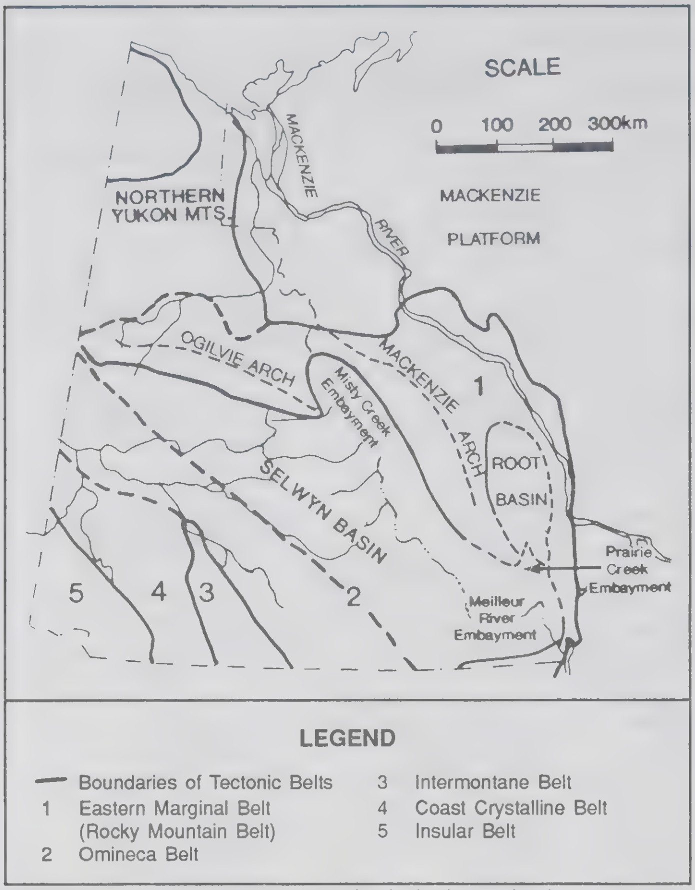

FIGURE 3-2: Physiographical belts of the northern Cordillera (adapted from Monger et al., 1972).

RICO, L&E CLAIMS

Procan Exploration
Company Limited
1400, 727 7th Ave SW
Calgary, Alta., T2P 0Z5

Lead, Zinc
95 F/10
61°35'N, 124°47'W

REFERENCES

Morrow (1984); Morrow and Cook (1987).
DIAND assessment report: 082302.

PROPERTY

RICO (186.16 ha) and L&E 1 (84.98 ha).

LOCATION

The claims are 180 km west of Fort Simpson, just north of Nahanni National Park (Fig. 3-1).

HISTORY

A mineralized quartz-calcite vein was discovered about 6 km north-northeast of Prairie Creek Minesite during construction of a winter road in 1980.

RICO, staked to cover this vein, was recorded July 21, 1980. L&E 1 was recorded August 24, 1981. A legal survey was conducted in 1982. The claims are in good standing until 1990.

DESCRIPTION

The shelf-edge Prairie Creek Embayment (Fig. 3-2) is a basinal structure in Selwyn Basin (Morrow, 1984). This embayment is an unfilled remnant of Root Basin (Morrow and Cook, 1987). The Cadillac vein system, a small but high-grade silver-lead-zinc deposit (Table 3-1), trends north-northeasterly, parallel to the trend of the Prairie Creek Embayment (DIAND assessment report 082302).

Lower Paleozoic mixed shales and carbonates, transitional between shelf-type carbonates to the east and basinal shales to the west, dip gently to the north. Consequently, the Ordovician Whittaker Formation, the Silurian Road River Formation, and the Silurian-Devonian Cadillac Formation, which host the Cadillac vein system, are not exposed on the property but underlie the Arnica Formation at a shallow depth (DIAND assessment report 082302).

The claim area is underlain by massive medium-grey dolomites with black chert lenses and layers of the Lower Devonian Arnica Formation and thin-bedded, platy, fine-grained medium- to dark-grey shaly limestone, limy shale or limy mudstone, devoid of fossils of the Middle Devonian Funeral Formation (DIAND assessment report 082302).

A regional scale north-northeast-trending anticline, which extends regionally for 25 km parallel to the Gates Thrust Fault, 3.5 km to the west, cuts through the property. Lineaments are developed parallel to the fold axis. The axial plane of the anticline exhibits considerable shearing but little actual displacement. The fold is tighter to the south than to the north. Two small anticlinal folds on the western limb were rotated or thrust faulted (DIAND assessment report 082302).

CURRENT WORK AND RESULTS

A 1900 m baseline was cut in 1986 for geological mapping and geochemical surveying control. Five hundred and ninety soil samples were collected for lead, zinc, silver and copper analysis.

Mapping outlined a large open anticlinal fold and small scale drag folds associated with regional thrust faults. There are three distinct phases of faulting in the area:

Phase 1 structures are dominantly north-northeasterly trending and are roughly parallel to the Gates Thrust Fault and to the anticlinal axis. On the RICO claim, a fault with this orientation separates the Arnica and Funeral formations;

Phase 2 structures are northwesterly and north-northwesterly trending faults which are probably related to Phase 1 (tensional features); and,

Phase 3 structures are westerly to west-northwesterly trending.

Minerals in the matrix of brecciated and stockworked Arnica Formation dolomite include: smithsonite, minor galena, and an occasional trace of malachite/azurite. They are found in areas proximal to north-northeasterly faults.

There are two showing types. One consists of massive, high-grade veins ranging in thickness from 0.3 to 1.7 m. Sulphides consist of galena, sphalerite and tetrahedrite with minor pyrite. Oxidation products include: smithsonite, malachite/azurite, and minor cerussite. The Winter Road vein, for example, which strikes north-northeasterly, is likely associated with Phase 1 fault structures, lies within 200 m of the axial plane of the anticline, contains quartz/calcite gangue, and cross-cuts the Arnica Formation dolomites. The other showing type consists of galena or traces of tetrahedrite or both, with smithsonite and occasionally malachite/azurite disseminated in a matrix of quartz and minor calcite cement in

breccias of the Arnica Formation.

Soil geochemistry outlined several lead, zinc, silver and copper anomalies. Five of these are along and downslope from a fault, and several correlate with mineral showings. A strong anomaly was delineated near the Arnica/Funeral contact at the south end of the claim block.

The geochemical analyses for the Winter Road showing were generally low.

PROSPECTING PERMIT 1113

Equinox Resources Limited	Gallium, Germanium
900, 625 Howe St.	Lead, Zinc
Vancouver, B.C., V6C 2T6	95 M/7
	63°15'N, 126°45'W

REFERENCES

Douglas and Norris (1961); Gabrielse (1967); Gabrielse *et al.* (1973, 1965).

DIAND assessment report: 082525.

PROPERTY

Prospecting Permit 1113 (17 402.1 ha).

LOCATION

The permit area is in the Redstone Mountains, 100 km east of Godlin Lakes and 210 km south of Norman Wells. The closest community is Wrigley on the Mackenzie River, 160 km to the east (Fig. 3-1).

HISTORY

Exploration in the Redstone Mountains during the mid-1970's by Cominco, Welcome North Mines Ltd. and individual prospectors delineated several showings such as the CAP, ADYJO, BOOM, and BLANCHE showings (Fig. 3-3). In 1976 Cominco drilled thirteen holes on the CAP property to test a small stratabound replacement-type zinc-lead deposit. The indicated grades of the showing were 15-20% Zn.

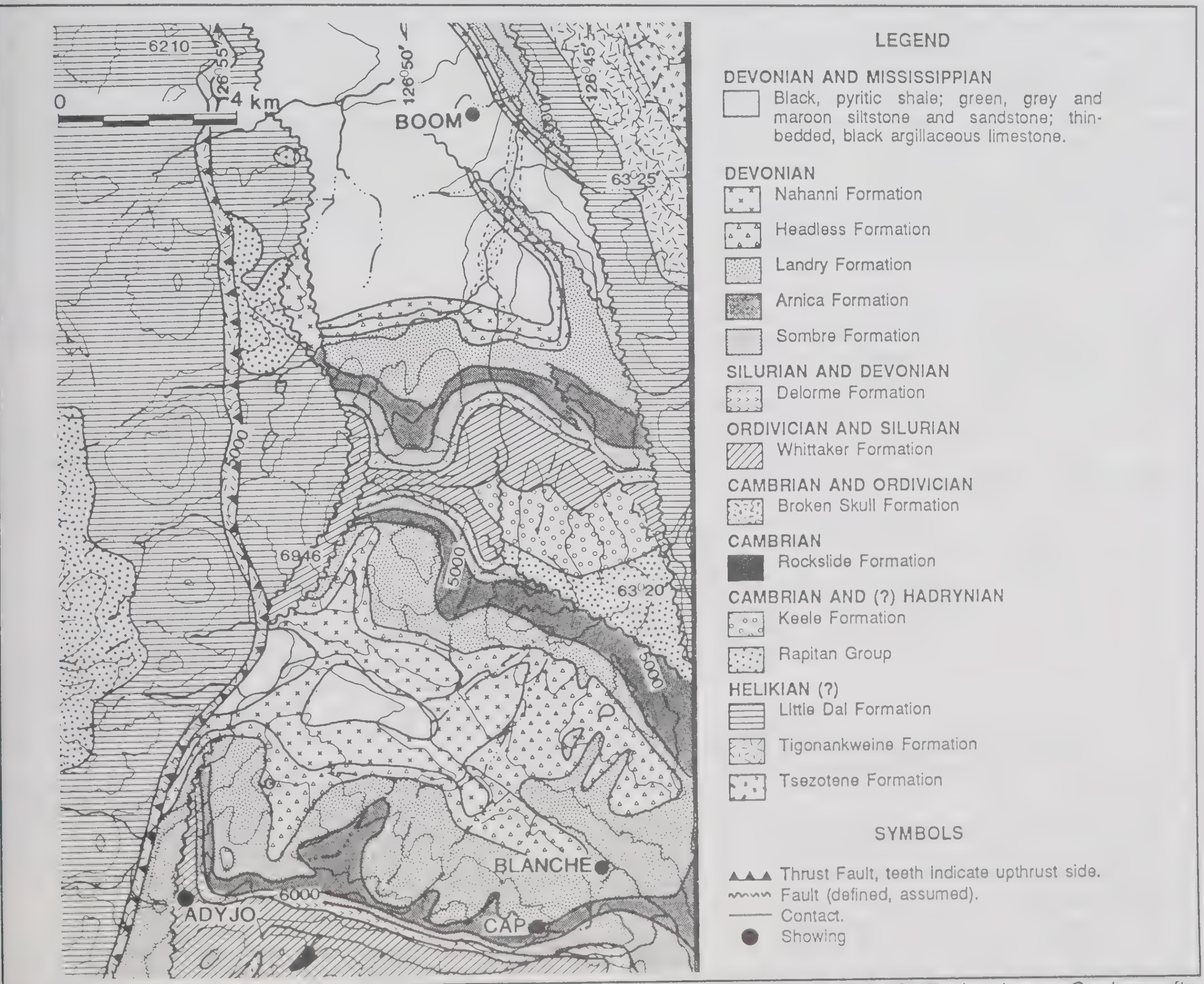

FIGURE 3-3: Regional geology of 95 M/7 west and CAP, ADYJO, BOOM and BLANCHE showings. Geology after Gabrielle et al. (1965).

Analyses of sphalerite found previously on these properties indicate possible economic concentrations of gallium and germanium. The area of interest (lead-zinc-gallium-germanium showings) was secured through a Prospecting Permit by Equinox Resources Limited in 1987. By agreement, Equinox has assigned a right to 50% of its interest to Vortex Resources Limited.

DESCRIPTION

The permit area is within the Redstone Arch (Gabrielse *et al.*, 1973), a sequence of folded and faulted Cambrian to Devonian carbonate rocks (Gabrielse *et al.*, 1965; Gabrielse, 1967). Facies changes involving carbonates and argillaceous carbonates and shales, and considerable variations in thickness are typical of the Devonian strata (Gabrielse, 1967).

Paleozoic strata on the eastern flank of the Redstone Arch are broadly folded. The CAP, BOOM and BLANCHE showings are on the gently dipping southwest limb of these synclines. Locally, folds and thrust faults end abruptly against northeast-trending faults along which transcurrent movement may have taken place (Douglas and Norris, 1961).

Numerous zinc-lead showings are: fillings in karst caverns and stratabound replacements within zones of coarse carbonate recrystallization; and, in the carbonates between the Middle Devonian Landry Formation micritic limestone and the Arnica Formation dolomite. Pod-like deposits and steeply dipping fracture fillings of reddish sphalerite and very coarse crystalline galena are associated with dolomite, quartz, smithsonite and pyrobitumen.

The CAP showing is in a zone of recrystallization, replacement and brecciation in the basal beds of the Landry Formation. Sphalerite and galena are found in, and surrounding, a solution collapse breccia zone. The breccia contains randomly-oriented angular limestone blocks up to 2 m in size. Coarse sparry dolomite is found between the fragments. Sphalerite may be within the dolomite, along the margins of the breccia fragments, associated with dolomite veining, or, as small replacement pods in fresh limestone.

CURRENT WORK AND RESULTS

Various zinc showings were examined and systematically sampled to assess their tonnage potential in 1987. Nine representative rock samples were collected from showings to assess the gallium and germanium potential of the sphalerite. Average assays were 0.019% Ga and 0.077% Ge. Concentrations of over 200 ppm (0.02%) Ge in a zinc concentrate is considered to be of economic interest.

TUNGSTEN, ASSOCIATED WITH SKARN DEPOSITS

Tungsten-bearing skarns are associated with an arcuate belt of mid-Cretaceous quartz monzonite and granodiorite intrusions (Dawson and Dick, 1978), the Selwyn Plutonic Suite (Anderson, 1983). These intrusions are along the hinge between predominantly clastic rocks of the Selwyn Basin and equivalent-aged carbonates of the Mackenzie Platform, and define a major tungsten district which includes the Cantung and MacTung deposits (Table 3-1) containing the largest reserves of tungsten in the western world.

The Cretaceous intrusions were emplaced into relatively unmetamorphosed rocks and contact metamorphic aureoles are well developed around them (Dick and Hodgson, 1982). The skarns are coarse-grained calcium-iron-magnesium silicates formed by replacement of carbonate-bearing rocks.

Chalcopyrite and pyrrhotite are associated with the skarns. The W:Cu ratios range from 6:1 to 7:1 and tungsten content increases with pyrrhotite content (Dawson and Dick, 1978). Skarn, hornfels and intrusive rocks may be cut by scheelite-bearing veins of quartz, quartz-tourmaline, and quartz-calc-silicates. Small quartz-molybdenite veins cut skarn and pelitic hornfels or occupy greisened zones in adjacent intrusive rocks (Dawson and Dick, 1978).

CED CLAIMS

Canada Tungsten Mining Corporation Limited	Tungsten
P.O. Box 12525	105 H/16
1600 - 1066 W. Hastings St.	61°57'31"N,
Vancouver, B.C., V6E 3X1	128°16'10"W

REFERENCES

Brophy (1987); Canada Tungsten Mining Corporation Annual Report 1984, 1985; Cummings and Bruce (1977); Dawson and Dick (1978); Dick and Hodgson (1982); Zaw (1976).

DIAND assessment report: 082137.

PROPERTY

Mining Lease 3129 (CED 41, Lot 1, Group 907), part of the Cantung Mine property.

LOCATION

Tungsten and Cantung Mine (Fig. 3-1) are within the lease area. Tungsten is serviced by a 306 km all-weather road from Watson Lake, 209 km to the south. A 1219 m gravel airstrip at the minesite accommodates STOL (short take-off and landing) aircraft.

HISTORY

The CED claim was staked in 1958 by Seymour Evenson, who then transferred the claim to K.J. Springer. Springer transferred the claim to Canada Tungsten Mining Corporation in 1959. The claim was taken to lease in 1963. The lease was renewed in 1984 for 21 years, and it is in good standing until November 15, 2004.

Underground drilling at Cantung, 213 m west of the previously defined orebody intersected grades of 1.92% WO_3 in 1984. Underground development included 1250 m of drifting and 244 m of raising. A million dollar surface exploration program of sampling, mapping, surveying, and drilling of 914 m was conducted on Lot 1 (Annual Report, 1984).

Underground exploration west of the orebody continued in 1985. In the exploration drift, good grades were found but a fault zone with relatively high water flow was encountered. A parallel exploration drift was driven through the fault zone (Annual Report, 1985). No surface work was done in 1985.

DESCRIPTION

The main regional structure in the Cantung area is a northwest-trending syncline cored by Cambrian limestone, flanked by Cambrian or earlier phyllite and intruded by Cretaceous quartz monzonite stocks. At Cantung, the 'Mine Stock' altered some of the limestone to ore-bearing skarn (Brophy, 1987).

The lease area is underlain by the Proterozoic sediments of the Lower "Phyllite unit" and the Lower Cambrian Sekwi Formation, which includes both clastic and carbonate beds. At Cantung, scheelite-bearing skarns are in two distinct lithological units in the Sekwi Formation: the Ore Limestone, a coarsely crystallized massive Lower Cambrian marble relatively free of impurities, which contains the bulk of the ore-bearing skarn (estimated reserves are 1.4 Mt of 1.20% WO_3); and the Swiss Cheese Limestone (estimated reserves are 0.97 Mt of 0.66% WO_3), with calcareous pods and thin discontinuous beds enclosed in an noncalcareous pelitic matrix, which unconformably underlies the Ore Limestone (Dick and Hodgson, 1982). The open pit orebody, on the upper limb of an overturned anticline (Cummings and Bruce, 1977) is mainly a garnet-pyroxene skarn with disseminated pyrrhotite-scheelite-chalcopyrite and many quartz-biotite veins (Dawson and Dick, 1978). The Ore Limestone plus the overlying and laterally equivalent dolomite are overlain by argillite. Overlying these rocks is a variable sequence of siltstone and dolostone including a prominent pink weathering dolomite (DIAND assessment report 082137).

The structurally controlled 'E-Zone' orebody, on the lower limb of the overturned anticline (Cummings and Bruce, 1977), is a garnet-pyroxene massive pyrrhotite skarn that gives way locally to biotite-amphibole (actinolite/tremolite) skarn (Dawson and Dick, 1978; Zaw, 1976).

CURRENT WORK AND RESULTS

Three AQ-size holes, totalling 282.2 m, were drilled from the parallel exploration drift in 1986 to intersect extensions of the E-Zone deposit. Samples were assayed for WO_3 whenever scheelite was detected using short wave UV light. Assay results included 2.3 m of 3.84% WO_3. The drill holes intersected argillites, cherts, limestones, quartz monzonites, and various assemblages of skarn minerals.

QUICK AND EASY CLAIMS

Hudson Bay Exploration and Development Company Limited	Tungsten
P.O. Toronto Dominion Centre	105 I/11
Toronto, Ont., M5K 1B6	62°39'N, 129°16'W

REFERENCES

Brophy (1987); Goodfellow (1982).
DIAND assessment reports: 080323, 081780, 082099.

PROPERTY

QUICK (418 ha) and EASY (263 ha).

LOCATION

The claims are 90 km north-northeast of Tungsten (Fig. 3-1). The Howards Pass deposit is 18 km to the south and Macmillan Pass is 75 km to the northwest. Access to the property is by helicopter. The claims are adjoined and partly enveloped by Canamax's NUG claims (Fig. 3-4).

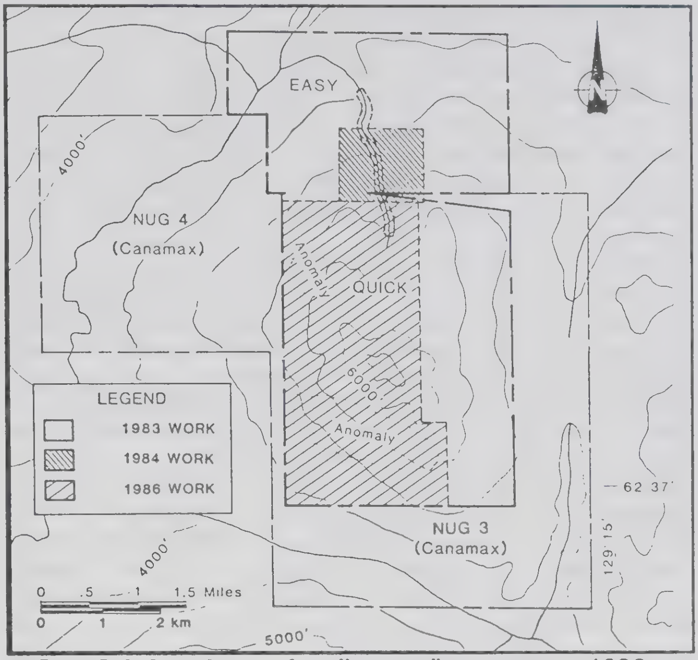

FIGURE 3-4: Area of soil sampling survey, 1986, on QUICK and EASY claims (from DIAND assessment report 082099).

HISTORY

On August 13, 1982, the Geological Survey of Canada (GSC) released the results of a geochemical silt sampling program covering the Nahanni map area (Goodfellow, 1982). QUICK was staked that same day to cover a 60 ppm tungsten anomaly detected by the GSC survey. EASY was added on the north side of QUICK the following year. The claims cover part of an area that was staked and explored for lead and zinc in the early seventies by Cowal Resources Ltd. (ROD claims; DIAND assessment report 080323).

In 1984, following encouraging 1983 panning, a twenty person-day program of panning, soil sampling and magnetic surveying was conducted (Brophy, 1987). Results of the analyses are: trace to 1.4 ppm Ag; 4 to 42 ppm Cu; and, 2 to 38 ppm W (DIAND assessment report 081780).

DESCRIPTION

The claim area, near the eastern margin of the Selwyn Basin, is underlain by Devonian to Mississippian Earn Group sand-banded argillites, argillaceous sandstone and chert pebble conglomerates. Quartz veins are common, particularly in the siliceous argillite and sandstone. There is a concentration of these veins, containing scheelite, in the southwest corner of the QUICK claim. The veins often have phyllic altered borders, and hornfels facies metamorphism is evident in some areas. This metamorphic overprint may be due to a buried intrusive which could also provide a source for the quartz-scheelite veins. At the north end of the claim block, the sparse outcrop of black argillaceous shales may be part of the Ordovician Road River Formation, which regionally underlies the Lower Earn Group (DIAND assessment report 082099).

CURRENT WORK AND RESULTS

Two hundred and forty soil or talus samples were collected in 1986, principally from the central and western portions of the QUICK claim and from one line along the property boundary. Samples were collected at 50 m intervals on lines 300 m apart.

All samples were analyzed for tungsten, copper, tin, and molybdenum; 44 samples were analyzed for gold and silver as well.

One hundred and ten 10 kg samples were collected from talus fines at 100 m intervals along section lines for panning. The samples were panned to 15 mL concentrates. Several samples contained thousands of scheelite grains, including some grains greater than 3 mm in diameter.

Grain counts of scheelite showed a strong correlation to geochemical results. Two strong linear trends outlined by the tungsten, copper, tin and molybdenum analyses and the anomaly delineated by tungsten, copper and gold-silver analyses coincided with higher scheelite grain counts.

Several multi-element targets were outlined in the quartz-scheelite veins in the lower Earn Group sand-banded argillites, sandstones and chert pebble conglomerates, and it is possible that tungsten skarn deposits could exist at depth in underlying Cambrian carbonates.

GOLD

Gold was explored for in various geological environments including auriferous quartz veins in the Lower Cambrian Sekwi Formation volcanics, auriferous skarns adjacent to Cretaceous intrusions, and placers in the tributaries of the Flat River.

CHUCK CLAIM

Serem (Quebec) Inc.	Gold
1110 4ième Ave.	95 D/15
Val D'or, Que., J9P 1JB	60°58'N, 126°34'W

REFERENCES

Gabrielse *et al.* (1973).
DIAND assessment reports: 081665, 082082.

PROPERTY

CHUCK 1 (1004 ha).

LOCATION

The claim is in the Caribou River area, 670 km west-southwest of Yellowknife (Fig. 3-1). Access to the property is by helicopter from Fort Liard, 190 km to the southeast.

HISTORY

The claim was staked in September, 1981 by Serem (Quebec) Inc., to protect gold anomalies detected in a regional heavy-mineral sampling survey in 1980 and from a more detailed follow-up silt sampling, prospecting and mapping survey in June of 1981.

Work in late September, 1981 consisted of mapping, soil sampling, rock geochemical sampling and silt sampling. Five silt samples, from the vicinity of the main creek on the claim, contained anomalous gold ranging from 1600 to 6600 ppb, and one pan concentrate sample assayed 15 000 ppb Au. Subsequent soil sampling in this area outlined arsenic anomalies exceeding 100 ppm. Float in the vicinity of the anomalies is mainly angular volcanic rocks of the Sekwi Formation. Samples of float containing quartz vein material with significant limonite boxwork returned assays up to 50 ppb Au and 212 ppm As.

DESCRIPTION

The CHUCK 1 claim is underlain by Lower Cambrian Sekwi Formation dark-green vesicular andesites and basalts interbedded with light-grey to green limey tuff, coarse grey-green volcaniclastic breccia and agglomerate, and medium-grey fine-grained andesitic rocks. Chlorite-epidote alteration is common in the andesites, which in some areas are intensely silicified and sericitised. Limonite, jarosite and hematite are found in these silicified areas. A distinct unit of orange-brown sandstone and sandy dolomite marks the top of the Sekwi Formation.

The Sekwi Formation is overlain by the medium-grey, wavy-banded limestones of the Upper Cambrian Rabbitkettle Formation (Gabrielse *et al.*, 1973). The rocks are folded into a southward-plunging open anticline known as the Caribou Anticline. There is only about 10% outcrop exposure on the property.

Economic minerals are restricted to the Lower Cambrian Sekwi volcanics and include bornite, malachite and chalcopyrite with associated pyrite, pyrrhotite and magnetite. The sulphides are present as disseminations, fracture fillings, fine stringers and fillings in amygdules. Some encouraging assays, 130 to 1500 ppb Au, were obtained from outcrop samples. Narrow, 4-10 cm, east-trending quartz veins, averaging 5 ppb Au and up to 18 ppm As, have been found along gullies and ridges.

CURRENT WORK AND RESULTS

Ten days were spent mapping and prospecting in 1986, to locate the source of gold and arsenic geochemical anomalies outlined by silt and soil samples. Pyrite- and arsenopyrite-bearing quartz veins are thought to be the source of the anomalies.

DOUG CLAIM

A. Black and D. Schellenberg	Gold
Watson Lake, Yukon, Y0A 1C0	95 E/8
	61°20'N, 126°28'W

REFERENCES

DIAND assessment reports: 080393, 080487, 082614.

PROPERTY

DOUG 1 (167.2 ha).

LOCATION

The claim is 190 km northeast from Watson Lake and 4.5 km west-northwest of MacMillan Lake (Fig. 3-1). It is on Moose Creek, a tributary of McLeod Creek which drains into the Flat River.

HISTORY

In the 1970's alluvial gold was found at the bottom of gravels in tributaries of creeks and in creeks that flowed into the Flat River. Nahanni Placers, in 1974, staked the WINDFALL (Bennett Creek), BINKER (McLeod Creek) and EPLER (Grizzly Creek) claim groups and explored them for placers by digging test pits and panning the material excavated. Pan and portable sluice box equipment were used to explore the claims in 1975. Only traces of gold were found. Lloyd Tyerman excavated a pit 4.9 m (16 ft) to the bedrock using a small suction dredge on the BINKER claims during the 1970's. These claims lapsed in 1978.

The DOUG claim was recorded September 12, 1985 by Doug Schellenberg and Alex Black. Alex Black excavated two test pits in 1985. The pits contained grey-blue clay with pyrite and black sand at 1 m depth (DIAND assessment report 082614).

DESCRIPTION

The claim is underlain by: interbedded shales; siltstones, which are in part calcareous; and, carbonates of the Sunblood Formation and the Road River Formation (Middle Ordovician to Lower Devonian). The sedimentary rocks are intruded by rusty weathering Cretaceous granodiorites (DIAND assessment report 082614) which domed and folded the sedimentary rocks into complementary anticlines and synclines (DIAND assessment report 080393).

At least 2.7 billion m^3 of material have been removed and transported eastward into McLeod Creek and then to Flat River (DIAND assessment report 080393). The gravels in the area are permeable, containing cobble- to boulder-sized rocks, and the creek has a high flow rate in the summer (DIAND assessment report 082614).

CURRENT WORK AND RESULTS

Exploration, in 1986, for the bedrock source of the alluvial gold consisted of re-cutting the trail from MacMillan Lake to the claims, mapping between the canyon of Moose Creek and the cabin and further up the valley (Fig. 3-5), and magnetic surveying. Mapping of black slates and carbonates revealed a northwest-striking, steeply west-dipping cleavage, indicating beds may be overturned (if the foliation in the carbonates is bedding). The slate contained under 1% sulphides as euhedral pyrite cubes up to 8 mm in size. Pyrite zones, up to 10 m thick, were delineated. Impure carbonates, to the west, were exposed and the transition from silty limestone to slate appeared gradational over a stratigraphic thickness of 200 m.

Two very irregular quartz veins, 0.5 m thick, were found in the canyon. The friable nature of the rock prevented access for sampling.

A bluish clay, at the bottom of the pits, contained pyrite and other heavy minerals (iron-titanium minerals) which were visible when panned. This clay might represent a fault zone. No visible gold was found in this material from panning, and no appreciable amount of gold was found from assaying.

An abrupt change in the magnetic field may indicate a change in the lithology. Bedrock is not exposed so either a normal or faulted contact is possible.

A bedrock source for the gold was not found. Alluvial gold may be at the rock surface; however, the tonnage of gravel at this locality may be limited.

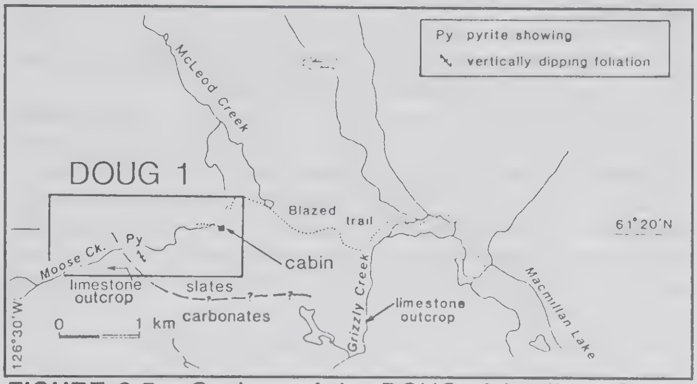

FIGURE 3-5: *Geology of the DOUG claim (from DIAND assessment report 082614).*

GRUMP CLAIM

Giant Yellowknife Mines Limited	Gold, Silver, Lead
Bag 3000	105 I/15
Yellowknife, NWT, XIA 2M2	62°56'15"N, 128°42'30"W

REFERENCES

Green *et al.* (1968); Gordey (1980, 1981).
DIAND assessment reports: 081108, 081914, 082362.

PROPERTY

GRUMP (523 ha).

LOCATION

The GRUMP claim is 16 km southeast of O'Grady Lake and 75 km east-southeast of MacMillan Pass on the NWT-Yukon border (Fig. 3-1). Access is by helicopter.

HISTORY

Auriferous massive sulphide-bearing boulders were discovered by Welcome North Mines Limited in 1979. They staked the area as the MASS claim. Grab samples assayed up to 11.4% Pb, 128.2 g/t Ag and 22.8 g/t Au. Welcome North Mines optioned the property to Riocanex Incorporated. Riocanex Inc. conducted VLF EM and vertical loop EM surveying, soil sampling, trenching and prospecting on the property in 1980, but were unable to find the source of the massive sulphide boulders. The claims lapsed in June, 1983.

Covello and Associates staked the GRUMP claim on June 6, 1983 and then transferred the property to Giant Yellowknife Mines on October 24, 1984. That year, Giant Yellowknife Mines conducted magnetic, gravity, VLF EM and geological surveys (DIAND assessment report 081914). Coincident magnetic, gravity and VLF EM anomalies over the baseline and auriferous boulders were outlined.

Grab samples of pyrrhotite-rich carbonates, assayed for copper, zinc, gold, silver, lead and arsenic, contained nil to trace concentrations of all metals, except for one sample which assayed 0.51 g/t Au. Grab samples of massive sulphide float assayed between 8.23 to 29.49 g/t Au (average 18.6 g/t), 7.54 to 147.43 g/t Ag (average 61.4 g/t), and 16 to 37% As (average 29%). Three lead assays ranged from 6% to 14%, but all zinc and copper assays were less than 1% (DIAND assessment report 081914).

The auriferous boulders are probably from a vein or system of veins comprising a small to large portion of the anomaly.

DESCRIPTION

The regional geology of the Nahanni map area is shown by Green *et al.* (1968) and Gordey (1980, 1981).

Grey-weathering, well-layered dolomite and limestone, possibly Lower Paleozoic sediments of the Road River Formation (DIAND assessment report 081108), are intruded by monzonite that forms a peripheral phase of the Cretaceous O'Grady Batholith (to the south). The main showing, disseminated pyrrhotite (up to 50%), minor chalcopyrite and sphalerite skarn developed within the irregular 50 m wide contact aureole around a monzonite. Also, there are numerous small boulders of massive arsenopyrite-galena-pyrite-chalcopyrite-sphalerite, probably derived from the trench excavated by Riocanex (DIAND assessment report 082362).

CURRENT WORK AND RESULTS

Exploration, in 1986, consisted of: drilling 4 holes totalling 250 m, to test geophysical anomalies with coincident auriferous sulphide-bearing boulders; sluicing; and, prospecting.

Prospecting determined that the sulphide boulders were locally derived but were not representative of the geophysically anomalous bedrock lithology immediately beneath them; drilling showed that the geophysical conductors are disseminated to banded sulphide-rich (pyrrhotite) silty carbonates adjacent to a large granodioritic intrusive; and, drill core assays were up to 0.867 g/t Au.

KAREN CLAIM

Clifton Star Resources Ltd.
1110, 625 Howe St.
Vancouver, B.C., V6C 2T6

Gold, Silver, Lead,
Zinc, Stibnite,
Tungsten, Tin, Arsenic
105 I/15
62°59'N, 128°40'W

REFERENCES

Anderson (1983); Gordey (1980).
DIAND assessment reports: 062199, 080501, 082039.

PROPERTY

KAREN 1 (334.44 ha).

LOCATION

The claim is 19 km east of O'Grady Lake and near the headwaters of the south Nahanni River (Fig. 3-1).

HISTORY

The original KAREN group (KAREN 1-107) was staked in 1974 to cover gossans found during prospecting and exploration by Canada Tungsten Mining Corp. Canada Tungsten, in 1975, conducted reconnaissance prospecting, mapping, trenching and sampling. Assays from the "main showing" ranged from 0.103 to 1.120 g/t Au and 0.34 to 49.7 g/t Ag. Numerous skarn zones were found and sampled. Galena, sphalerite, stibnite and cassiterite were present in anomalous amounts, but the showings were considered to be too small and low grade to be of economic interest. The claims lapsed in February, 1981.

The area was restaked as KAREN 1 by J.C. Turner in March 4, 1981. Turner transferred the claims to W.R. Michaluk on June 30, 1981, who in turn transferred them to Houstonian Resources Inc. (now Clifton Star Resources Inc.) on September 14, 1981.

DESCRIPTION

The claim area is underlain by sedimentary rocks, ranging in age from Late Proterozoic to Devono-Mississippian, that change facies rapidly across generally northwest-trending hinge lines (Gordey, 1980). Massive, but locally well-bedded, finely-crystalline, grey to dark-grey limestone outcrops in the claim area (DIAND assessment report 082039). The limestone contains Heliophyllium corals which indicate Devonian age. Beds of quartzite, siltstone and chert, exposed mainly in felsenmeer, were noted locally.

The sediments are intruded to the south and east of the claim area by the O'Grady Batholith (Fig. 3-6; DIAND assessment report 082039), part of the northeastern belt of the Selwyn Plutonic Suite comprising hornblende granite and hornblende granodiorite (Anderson, 1983). Tourmaline-bearing calcsilicate hornfels are found as far as 1 km north of the northern margin of the batholith. Tourmaline-bearing, rarely miarolitic, aplite and granite pegmatite dykes are widespread, especially in the immediate country rocks (Anderson, 1983).

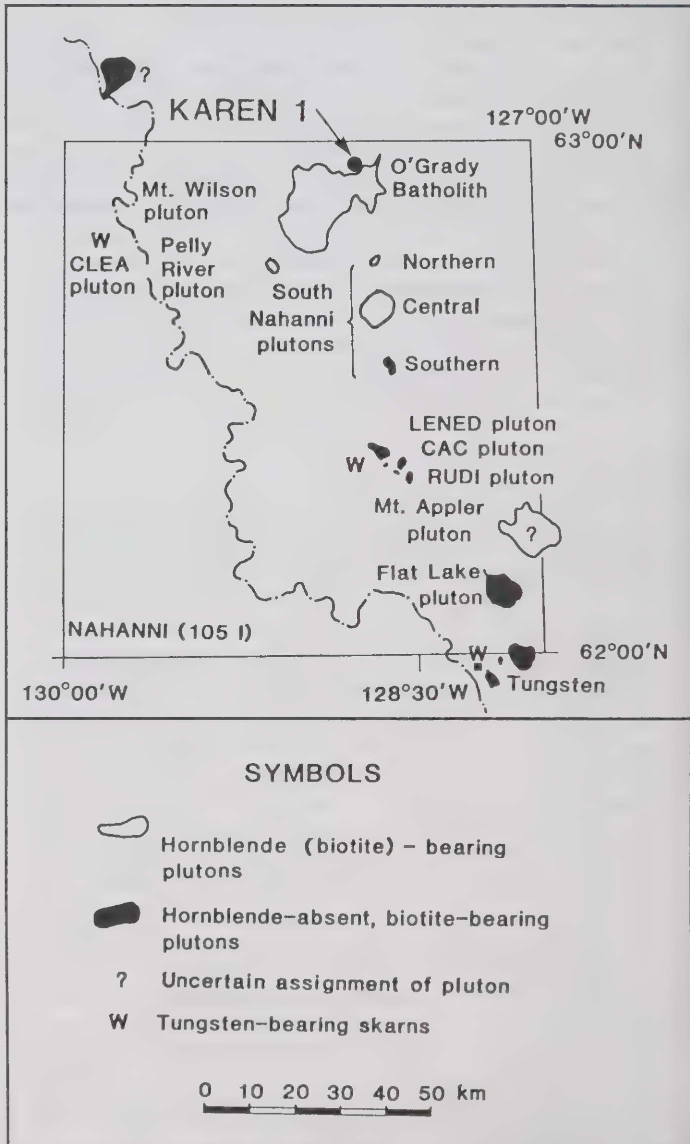

FIGURE 3-6: KAREN claim and various plutons in the Cordillera (adapted from DIAND assessment report 082039).

Altered carbonates of Ordovician, Silurian and Devonian age contain pods and lenses (2 m by 10 m) of sulphide-bearing (pyrite-pyrrhotite) skarn with anomalous concentrations of lead, zinc, antimony, tin, silver and gold. These skarns are interpreted as contact metamorphic and fault-controlled deposits (DIAND assessment report 082039).

CURRENT WORK AND RESULTS

Exploration consisted of mapping, prospecting, and sampling during 1985. Three types of mineral showings have been found in the claim area:

1. pyrite-stibnite-sphalerite-arsenopyrite in shear zones (main showing);
2. skarns adjacent to intrusive contacts; and,
3. disseminated pyrite and pyrrhotite in intrusive rocks.

The main showing is a gossan formed at the intersection of several shear zones. Nearby a porphyritic, quartz monzonite dyke may have been emplaced along a similar structure. Skarn minerals have been traced along the northern margin of a porphyritic quartz monzonite dyke which cuts across the central part of the claim area. The skarn is garnet, vesuvianite, wollastonite and calcite with minor disseminated pyrite and pyrrhotite.

Assay results of rock sampling included: 6.58% Pb, 1.70% Zn, 4.06% As, and 4.20% Sb over 0.7 m on the main showing; 45 ppm W from two skarn samples; and, 22 ppm Sn, also obtained from a skarn sample. Elsewhere, the skarns are only weakly mineralized with sulphides, and geochemical sampling revealed only weakly anomalous amounts of tin and tungsten.

COAL

Coal exploration during 1981 and 1982 was in the Cretaceous and Tertiary rocks of the Great Bear Lake and Mackenzie Delta areas.

COAL EXPLORATION LICENCES 321-333

Echo Bay Mines Ltd.	Coal
Exploration Office	96 H/2,3,6,7,8
10354 Granville Sq.	121°00'N, 65°15'W
200 Granville St.	
Vancouver, B.C., V6C 1S4	

REFERENCES

Balkwill (1971).
DIAND assessment report: 062189.

PROPERTY

Coal Exploration Licences 321-333 (210 852 ha).

LOCATION

The thirteen coal exploration licences cover Grizzly Bear Mountain, Great Bear Lake, which is 450 km northwest of Yellowknife (Fig. 3-1). Port Radium is 80 km northeast of the licence area.

HISTORY

The geology of Grizzly Bear Mountain was mapped by the GSC at a scale of 1:500 000 (Balkwill, 1971). A reconnaissance helicopter traverse to find and sample reported coal showings was conducted on August 27, 1981 by Echo Bay Mines. Subsequently it obtained thirteen coal exploration licences on August 31, 1981. The coal exploration licences were relinquished on August 31, 1982.

DESCRIPTION

Grizzly Bear Mountain is underlain by Upper Cretaceous, flat-lying: shale; siltstone; mudstone with thin layers of lignite; and, sandstone with a 1.5 m thick, soft, black coal seam (Balkwill, 1971). There is little outcrop because of a thick cover of glacial drift.

CURRENT WORK AND RESULTS

Four coal showings were found during a helicopter supported reconnaissance traverse in August, 1981; three showings were sampled. The coal is lignite B by rank, but has a high barium content. The extent of the coal and the number of seams could not be determined due to extensive glacial drift cover, but probably underlies all of Grizzly Bear Mountain.

COAL EXPLORATION LICENCE 156

Petro-Canada Resources	Coal
Coal Division	117 A/9
Box 2844	68°41'N, 136°15'W
Calgary, Alta., T2P 3E3	

REFERENCES

Long (1986); Norris (1981); Young (1975).
DIAND assessment reports: 062123, 062162.

PROPERTY

Coal Exploration Licence 156 (25 628 ha).

LOCATION

The Coal Mine Lake property, on the western edge of the Mackenzie Delta, is approximately 110 km northwest of Inuvik (Fig. 3-1). The western edge of the property coincides with the Yukon border.

HISTORY

Coal was discovered in this area by the Inuit. The GSC has mapped intermittently in this region since 1915. Coal was mined, from 1940 to 1956, from a vertical seam at the southwest corner of Coal Mine Lake and barged to Aklavik where it was used as fuel. The mining venture ended when coal could not be mined any further because the seam was displaced by a major fault.

Petro-Canada Exploration Inc. was issued a coal exploration licence in April 1981. Petro-Canada applied for the coal licence because GSC reports described thick coal seams exposed along the banks of Aklak Creek (DIAND assessment report 062162). The coal exploration licence expired April 27, 1984.

DESCRIPTION

The sediments on the property are part of a series of Cenozoic mollassic wedges deposited in the Richards Island Basin. Thick coal seams are in the Aklak Member at the base of the Tertiary Reindeer Formation. The shallow-dipping

Reindeer Formation is bounded by nearly vertical, planar faults (Long, 1986). The Aklak Member includes cobble conglomerates, sandstones, shales and coal seams. The environment of deposition is interpreted as an alluvial plain deposit. Twenty-one coal seams, ranging in thickness from 0.4 to 4.4 m, were delineated in a stratigraphic thickness of 300 m (DIAND assessment reports: 062123, 062162).

The regional structure of the Arctic Coastal Plain is characterized by north- to northeast-trending folds and high angle normal faults. Within the study area, normal faults are inferred along the western margin of the Tertiary deposits. Deformation of the strata is minimal and appears to be restricted to near the fault planes (DIAND assessment reports: 062123, 062162).

CURRENT WORK AND RESULTS

A two-man reconnaissance team visited the area in 1981 to inspect the coal showings. Thick seams of sub-bituminous to high volatile C bituminous coal, containing approximately 30% ash, were verified. An area of approximately 10 km^2 is underlain by gently dipping coal-bearing strata. A deposit of 30 to 50 Mt of sub-bituminous to high volatile C bituminous coal is possible for this area.

In July and August 1982, a three-man crew mapped at 1:5000 scale, excavated 21 trenches, and sampled coal of the Aklak Member of the Reindeer Formation in the vicinity of Coal Mine Lake.

Several hundred million tonnes of high quality thermal coal underlay the property. Inferred geological reserves of over 500 Mt are estimated in the central and eastern portions of the property. The southwestern area, west of Aklak Creek, may contain additional resources. The geologic structure of the area is simple. Gentle bedding dips suggest surface mining potential with average *in situ* strip ratios of less than four bank cubic metres per tonne. The high specific energy values and low ash and sulphur content of this coal indicate its suitability for thermal power generation.

VANADIUM

A vanadium showing in Silurian-Devonian argillites was evaluated in 1971 to determine reserves and operating costs. This work is documented here since it was not reported in previous Mineral Industry Reports.

PAB CLAIMS

Placer Development Limited	Vanadium
1600 Bentall IV	105 I/1
1055 Dunsmuir St.	62°04'30"N,
Vancouver, B.C., V6C 1A8	128°25'W

REFERENCES

DIAND assessment report: 062261.

PROPERTY

PAB 1-27.

LOCATION

The claim is on the western border of the District of Mackenzie, 19 km northwest of Tungsten, and 210 km north of Watson Lake, Y.T. (Fig. 3-1).

HISTORY

Three areas with anomalous metal contents near the Flat River headwaters were delineated by geochemical prospecting during 1966. The PAB, PAT and GAIL claims were staked in 1967 to cover these areas. Argillite samples collected from the PAB claims, by William McIntosh, contained anomalous amounts of vanadium. Samples collected from the PAT and GAIL claims had little economic potential; thus, these claims lapsed.

The New Brunswick Research and Productivity Council (NBRC) studied the mineralogy of the argillites during spring, 1968, to identify the vanadium-bearing mineral. The vanadium-bearing mineral was determined to be a mica, probably roscoelite.

A study investigating the potential for utilizing geophysical exploration techniques was undertaken in mid-July, 1968. Resistivity, SP and EM surveys were carried out, but only SP was able to delineate mineralized rock. A brief and unsuccessful geological reconnaissance and regional geochemical stream sampling program was carried out by D.A. Howard. Howard recommended additional stream sampling, trenching, mapping and diamond drilling be done. The drilling was attempted during 1969, but aborted due to technical difficulties. No core was recovered.

A preliminary metallurgical program to explore the potential for vanadium recovery from the argillites consisted of bench scale tests. Recoveries of 80% were indicated. The most promising process utilized in these tests was an oxidizing roast, salt roast, sulphuric acid leach procedure.

The claims lapsed May 29, 1987.

DESCRIPTION

The PAB claim area is near the western boundary of the Selwyn Basin. Four units of Devonian-aged argillite are exposed on the property.

The argillites overlie the 'Trilobite bearing argillite' which in turn overlies the Lower Cambrian Swiss-Cheese Limestone. The second unit of argillite is a sequence of medium-bedded, compact, black, graphitic argillites and is the principal vanadium-carrying unit on the property. In addition to vanadium minerals, these rocks contain up to several percent very fine-grained pyrite.

Samples of the vanadium-bearing argillite contain greater than 0.4% V_2O_5. The bed is approximately 56.4 m thick in outcrop section and 29.9 m thick in drill hole intersection. The average grades of the two sections are respectively 0.59% and 0.49% V_2O_5.

CURRENT WORK AND RESULTS

The work was done in 1970 but was not reported in previous Mineral Industry Reports.

Five holes were drilled, totalling 321.9 m, to determine the continuity of the vanadium-bearing rocks and to acquire stratigraphic information in areas of limited outcrop. Only one hole intersected rocks with significant vanadium content (average 0.49% V_2O_5). Sections penetrated by the drill holes could not be correlated with either sections measured in outcrop or in other diamond drill holes. The drill holes probably penetrated portions of the stratigraphic section not exposed in outcrop.

Reserves were estimated at 2.72 to 4.54 Mt to a depth of 121.9 m in the block between upper Janice Creek and Jim Creek. Additional reserves are probably available both at greater depth and northeast of Janice Creek.

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CHAPTER 4
ARCTIC ISLANDS REGION

Walter A. Gibbins
District Geologist Arctic Islands

INTRODUCTION

The Arctic Islands Region corresponds to the District of Franklin; it includes the Arctic Islands and Melville Peninsula.

The Arctic Archipelago includes all or parts of several major geological provinces. To the south and east it is bound and in part underlain by Precambrian rocks of the Canadian Shield as exposed in the Minto Arch, the Boothia Uplift, and on Melville Peninsula, eastern Devon Island, Ellesmere Island, and most of Baffin Island (Fig. 4-1).

The north-trending Boothia Uplift, which divides the Arctic Platform and Franklinian Geosyncline into eastern and western parts, developed mainly in Silurian and Devonian time in response to periodic faulting. The Sverdrup Basin, which in late Proterozoic and Mesozoic time was superimposed on the folded Franklinian Geosyncline, was itself folded in Cenozoic time. Relatively undisturbed Proterozoic sediments occur in several parts of the Arctic Islands, notably northern Baffin, Victoria, Somerset and Ellesmere islands. Comprehensive reviews of the evolution of the Canadian Arctic Islands are given by Thorsteinsson and Tozer (1970) and by Kerr (1981). A volume entitled Geology of the Innuitian Province has been prepared for the Geology Society of America's Decade in North America Geology project and should be released in 1990. Summaries of the mineral resources of the Arctic Islands have been prepared by the Geological Survey of Canada (1980a) and by Gibbins (1982, 1989).

The region's two operating mines, Cominco Ltd.'s Polaris Mine on Little Cornwallis Island and Nanisivik Mines Ltd.'s Nanisivik Mine at Strathcona Sound, northwest Baffin Island, are the two most northerly metal mines in the world. The 1986-1987 production from the two mines is estimated at 70 000 t of lead concentrate and 600 000 t of zinc concentrate. Zinc concentrate from the Nanisivik mine also contains considerable silver and cadmium (see Chapter 2).

During 1986 and 1987, mineral exploration activities in the Arctic Islands continued to decline from the record levels of 1980-83 (Gibbins, 1984, 1985) and failed to match 1984-85 levels (Gibbins, 1987). Except for small projects on Victoria Island and the Melville Peninsula in 1986, (Fig. 4-1) exploration during 1986 and 1987 was confined to the vicinity of the region's mines, Polaris and Nanisivik.

Several university theses relevant to Arctic mineral exploration were recently completed. Arne (1986) did a comprehensive study of fluid inclusions at the Nanisivik Mine and their bearing on ore genesis. Ghazban (1988) studied sulphur and carbon isotopes at Nanisivik. He determined that sulfate from seawater or evaporites was reduced by oxidation of hydrocarbons under hydrothermal conditions, and formation of light carbon dolomite. Neumann (1988) considers that ore deposition at Nanisivik took place in several pulses (seismic pumping) of hot brines along paleokarst structures. Nentwich (1987) describes the stratigraphy, sedimentology and breccia pipes in the Ordovician and Silurian Brodeur Group (Ship Point, Baillarge and Cape Crawford formations) of the Brodeur Peninsula, northwestern Baffin Island. The recent release of Thorsteinsson's (1986) map of Cornwallis and adjacent islands is also noteworthy.

The mineral rights of a large portion of northeastern Ellesmere Island (almost 40 000 km^2) were removed in June l982 by Privy Council Order Number 1982-1875 as Ellesmere Island National Park Reserve. This includes parts of NTS areas 120 C-F and 340 D, E and H. An assessment of the mineral and hydrocarbon resource potential of this area was published by the Geological Survey of Canada (1981a).

In June 1984, representatives of the Government of Canada and the Committee for Original Peoples' Entitlement (COPE), representing the Inuvialuit of the western Canadian Arctic, signed final agreement for land rights settlement. Under this agreement, 13 000 km^2 (5000 sq. mi.) of lands, including surface and subsurface rights, were granted to COPE. These are known as 7(1a) lands and are mainly around Inuvialuit communities. The surface rights to another 78 000 km^2 (30 000 sq. mi.) of land, excluding subsurface rights, were also granted to COPE. The subsurface rights for these lands, known as 7(1b) lands, fall under legislation such as the Canada Mining Regulations and the Canada Oil and Gas Act. However, access to these lands requires that prior notice be given to the Inuvialuit. The 7(1b) lands are mainly in coastal areas of southern Banks Island, western Victoria Island and the adjacent mainland between the Crocker River and the Alaska border (Indian and Northern Affairs Canada, 1984).

Scheduled jet service is available to Resolute Bay, Cambridge Bay, Nanisivik, Iqaluit (Frobisher Bay) and Hall Beach. Most Arctic settlements have scheduled Twin Otter flights at least once a week. Camp moves and resupply flights for exploration crews are usually by chartered Twin Otters equipped with oversize tires for landing directly on the Arctic tundra. These aircraft are normally available in Resolute Bay, Iqaluit and Hall Beach.

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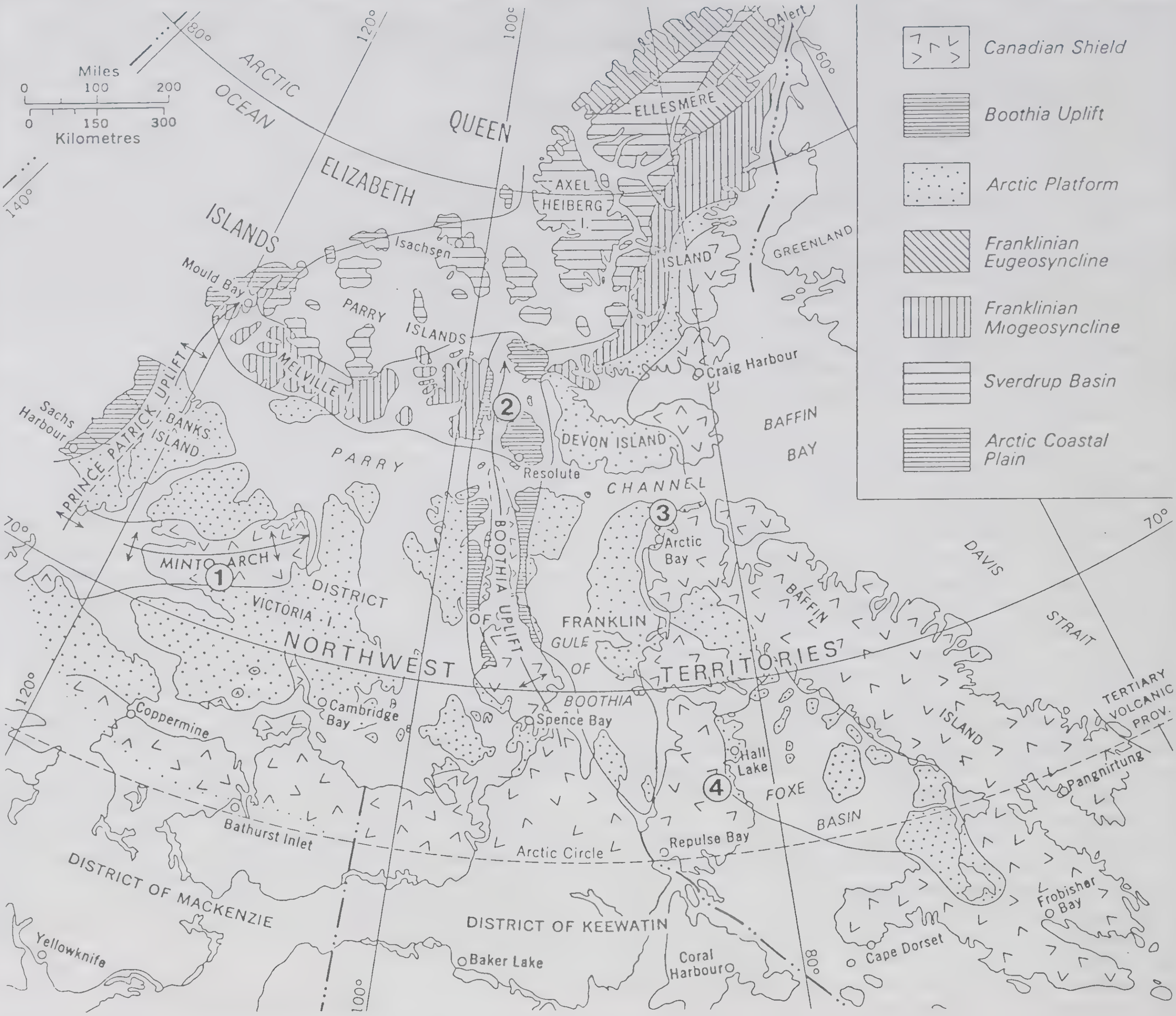
VICTORIA ISLAND

Victoria Island is underlain by crystalline Precambrian basement rocks, a concordant sequence of Proterozoic sediments known as the Shaler Group comprising clastics, carbonates and gypsum-anhydrite (Table 4-1). A younger unit, the Natkusiak Formation composed of basalt flows and volcaniclastics disconformably overlies these sedimentary rocks and follows the axis of the Holman Island Syncline. Closely related to these volcanics are widespread diabase-gabbro sills and dykes (Christie, 1964) that have the same age (650 Ma), chemical and petrological characteristics as the Coronation sills to the south (Baragar, 1977).



ID	AREA	GEOLOGICAL TARGET	COMMODITY	ORGANIZATION
1.	Northwest Victoria Island	Proterozoic sediments and volcanics of Shaler Group	Copper, Silver	Panarctic Oils Ltd.
2.	Polaris Mine, Little Cornwallis Island	MVT deposits in Thumb Mountain Fm. dolomite	Zinc, Lead	Cominco Ltd.
3.	Nanisivik Mine, NW Baffin Island	MVT deposit in Society Cliffs Fm. dolomite	Zinc, Lead, Silver	Nanisivik Mines Ltd.
4.	Melville Peninsula	Iron formation	Gold, Iron, Zinc, Nickel	Borealis Exploration Ltd.

FIGURE 4-1: *Geological provinces of the Arctic Archipelago showing areas of mineral exploration during 1986-87.*

These rocks are exposed in the Minto Arch (Fortier *et al.*, 1963), a structure that dominates the geology of northwestern Victoria Island (1 in Fig. 4-1). Precambrian strata of the Minto Arch form a northeast-trending synform, the Holman Island Syncline (Figs. 4-2 and 4-3). The Minto Arch became a positive topographic feature during the Paleozoic and underlies most of the Diamond Jenness Peninsula, the Saneraun Hills and the Shaler Mountains (Fig. 4-2).

> The angular discordance between the Palæozoic and the Precambrian rocks of the Minto Arch demonstrates that the Walker Bay anticline and the Holman Island syncline were folded prior to deposition of the earliest Palæozoic rocks in the area. Later crustal movements, however, are clearly responsible for the present position of the Minto Arch as a structural high, or uplift, with homoclinal sequences of Palæozoic rocks dipping away from the Arch. There is no evidence in the stratigraphic column of the map-area to suggest that the Minto Arch underwent sudden uplift at any time. The essentially homoclinal sequence of Upper Cambrian(?) to Upper Devonian strata that extends through Prince Alberta Peninsula into northeast Banks Island presumably developed as a result of the positive movement that effected the Minto Arch. The uplift is, therefore, presumably Upper Devonian or later. Lower Cretaceous rocks rest unconformably upon the Palæozoic strata... and this suggests that the uplift of the Minto Arch took place prior to the Lower Cretaceous.
>
> The Boothia Arch, east of the map-area, is known to have moved positively, and relatively violently, in late Silurian to early Devonian time... Latest Silurian and early Devonian rocks are not exposed on Victoria Island; consequently there is no record of events for this period. It is conceivable that the Minto Arch moved in late Silurian or early Devonian time (i.e., at the time of movement of the Boothia Arch), but this is improbable (Thorsteinsson and Tozer, 1962, p. 72).

TABLE 4-1: TABLE OF FORMATIONS, VICTORIA ISLAND

QUATERNARY	
18	Areas of thick glacial drift; mainly morainal; outcrops of bedrock are very scarce.
	Unconformity.
ORDOVICIAN	
12	BLUE FIORD FORMATION: limestone, shale.
SILURIAN	
11	READ BAY FORMATION: limestone, dolomite, shale.
CAMBRIAN? ORDOVICIAN AND SILURIAN	
10	10a, Cambrian? sandstone, minor shale, siltstone, dolomite; 10b, Ordovician and Silurian, dolomite, minor chert, shale, sandstone.
	Unconformity.
LATE PRECAMBRIAN	
9	Gabbro dykes and sills; sill not mapped.
8	NATKUSIAK FORMATION: basalt flows; minor agglomerate.
	Low angle unconformity.
	SHALER GROUP (3-7c)
7c	KUUJJUA FORMATION: mainly coarse-grained quartz sandstone, minor conglomerate and limestone.
7b	UPPER KILIAN FORMATION: Sabkha-environment red and tan shaly limestone, grey sabkha carbonates with gypsum beds, and red siltstone.
7a	LOWER KILIAN FORMATION: varicoloured evaporitic mudstone and bedded gypsum/anhydrite.
6	WYNNIATT FORMATION: limestone, minor dolomite, shale, sandstone.
5	MINTO INLET FORMATION: gypsum, anhydrite, minor sandstone, limestone, shale, dolomite, siltstone.
4	REYNOLDS POINT FORMATION: limestone, sandstone, minor siltstone, shale.
3	GLENELG FORMATION: sandstone, limestone, dolomite, conglomerate.
	Unconformity.
2	HADLEY BAY FORMATION: quartzite, sandstone, rare conglomerate and dolomite.
	Unconformity.
1	Pink, coarse-grained granodiorite.

NORTHWEST VICTORIA ISLAND RECONNAISSANCE

Panarctic Oils Ltd.	Copper, Silver
P.O. Box 190	76 G/13; 78 B/14;
Calgary, Alta., T2P 2H6	87 E/13, F/16, G/1,
	H/3,4,7,9,10,15,16; 88 A/1
	70°52'-72°08'N,
	111°30'-116°30'W

REFERENCES

Baragar (1976, 1977); Christie (1964); Gibbins (1987); Jefferson (1985); Jefferson *et al.* (1985); Newbury (1969); Palmer and Hayatsu (1975); Thorpe (1972); Thorsteinsson and Tozer (1962).

DIAND assessment reports: 081858, 082091.

PROPERTY

Twenty-six prospecting permits (974-997, 1075 and 1076) encompass 643 120 ha.

LOCATION

The prospecting permits cover most of the volcanic rocks of the Natkusiak Formation of northwestern Victoria Island (Fig. 4-2) and can be divided into two groups. The southwest block, 10 permits, occupies the central core of Diamond Jenness Peninsula, immediately south of the Kuujjua River. The second group, 16 permits, includes most of the northeast-trending Saneraun Hills and Shaler Mountains (Figs. 4-2 and 4-3).

The area is 50 to 275 km northeast of Holman Island and roughly 425 km northwest of Cambridge Bay, the only established communities on Victoria Island. However, the Panarctic Oils Ltd. mineral camp was resupplied by Twin Otter STOL aircraft from their base at Rea Point, Melville Island, 500 km to the northeast.

HISTORY

Copper on Victoria Island was first reported by V. Stefansson in 1913 on the basis of reports given to him by Inuit in Prince Albert Sound. However, Thorsteinsson and Tozer (1962, p. 77) were the first people of European origin to observe copper ('a few small flecks and flakes') *in situ* in the volcanic rocks of the Natkusiak Formation.

During 1968-70, copper exploration in the Coppermine River area 'spilt over' to Victoria Island as the Muskox Syndicate, Grandroy Mines Ltd. and the M.J. Boylen Engineering Co. Ltd. prospected and explored the Natkusiak Formation for copper. Numerous copper showings were discovered and limited mapping, drilling and geophysical surveying were done in an

attempt to delineate the economic potential of some of the best showings. Many of the initial targets were vein-type deposits, associated with a series of north-trending faults that transect the Proterozoic section (Thorpe, 1972, p. 141-145).

In 1982, a four-person crew of Panarctic Oils Ltd. collected stream water and stream sediment samples that were assayed for uranium, copper, silver, gold, nickel, iron and/or chromium (Gibbins, 1985). They also examined four areas of known copper showing, and four main types of copper-silver showings (Gibbins, 1985).

Panarctic Oils Ltd. acquired Prospecting Permits 974 to 997 on February 1, 1983, and 1075 and 1076 in 1985.

In 1983, several hundred stream sediment samples were collected and analyzed to complete coverage of the area. Sixteen copper-silver anomalies were outlined, prospected and geologically mapped. The area around the W-5 showing (Trident Creek area), which was discovered and drilled by the Muskox Mines Syndicate in the late sixties (Thorpe, 1972, p. 142), was prospected.

During the 1984 field season, 20 areas around stream sediment geochemical anomalies were examined; work included measuring and mapping several stratigraphic sections and prospecting. Numerous mineral showings were discovered and have been classified into several distinct types (Jefferson *et al.*, 1985, Table 27.2, p. 210). Detailed work was concentrated in two areas: Trident Creek area and Polar Bear Prospects area (Fig. 4-3), both of which are along the western side of the northern block of the Natkusiak Formation (Gibbins, 1987).

During June and July 1985, 17 holes (396.3 m) were drilled in the Parkall Valley area (southeast corner of Prospecting Permit 983) and the Newbury Creek area (south central Prospecting Permit 984).

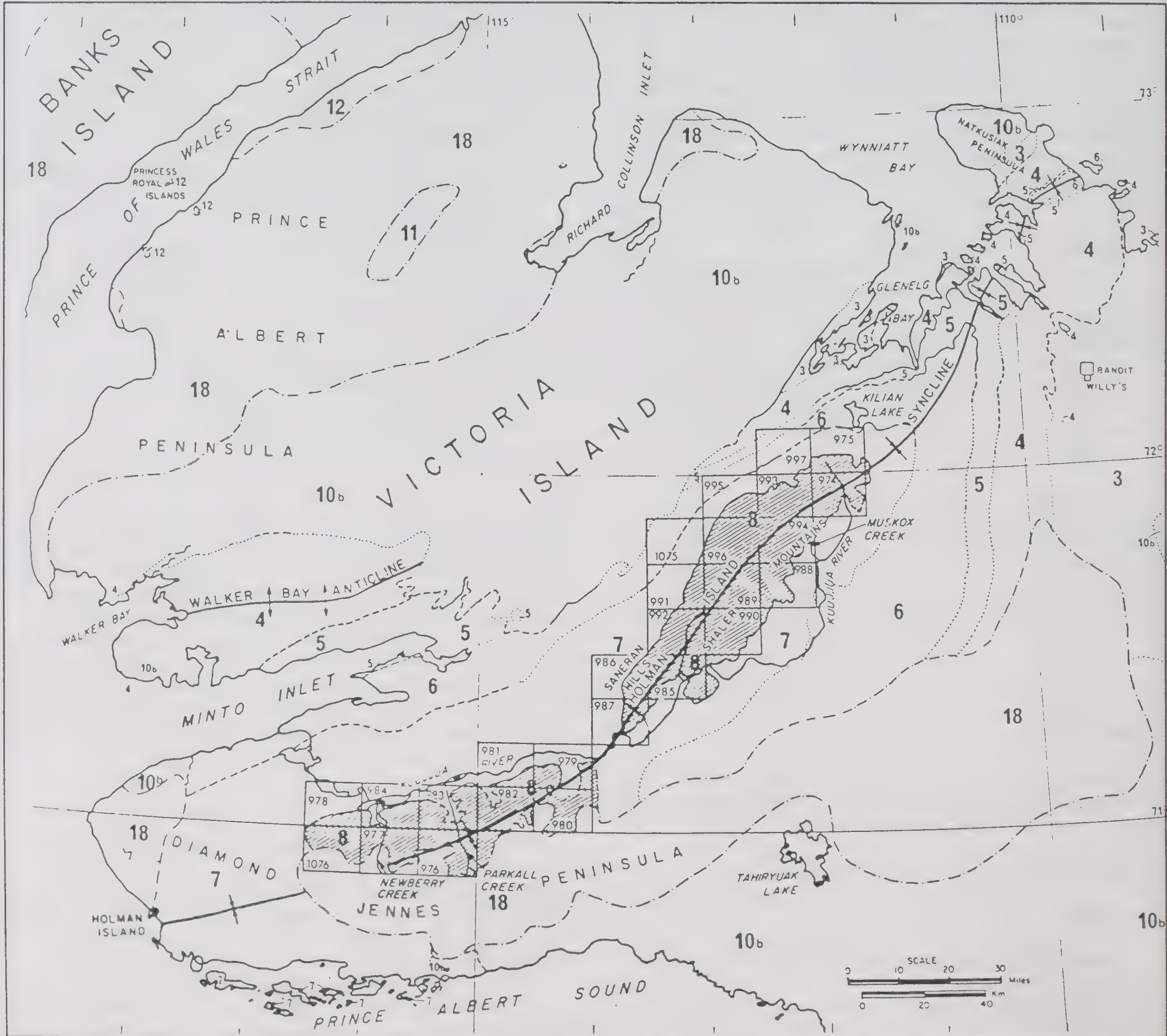


FIGURE 4-2: Map of Precambrian geology and permit areas, northwestern Victoria Island, modified (from Thorsteinsson and Tozer, 1962). See Table 4-1 for legend.

Newbury Creek Area - PP 984

Eleven holes (300.9 m) tested a series of horizontal zones of chalcocite-native copper-malachite-prehnite-quartz-calcite minerals. These zones are parallel to horizontal flow banding in the Lower Recessive Member of the Natkusiak Formation.

Eight holes reached targeted depths without encountering significant copper minerals; three holes were abandoned in permafrost. Only scattered grains of copper and occasional veinlets of chalcocite were encountered.

Parkall Valley - PP 984 and 977

Six holes (95.7 m) tested a series of vertical chalcocite veins and veinlets in the volcaniclastic member of the Natkusiak Formation. These veinlets are associated with light green zones of alteration to bentonite. This bentonite alteration caused problems in drilling and forced four of the six holes to be stopped short of the main target. Drilling results were inconclusive.

All 26 permits have lapsed.

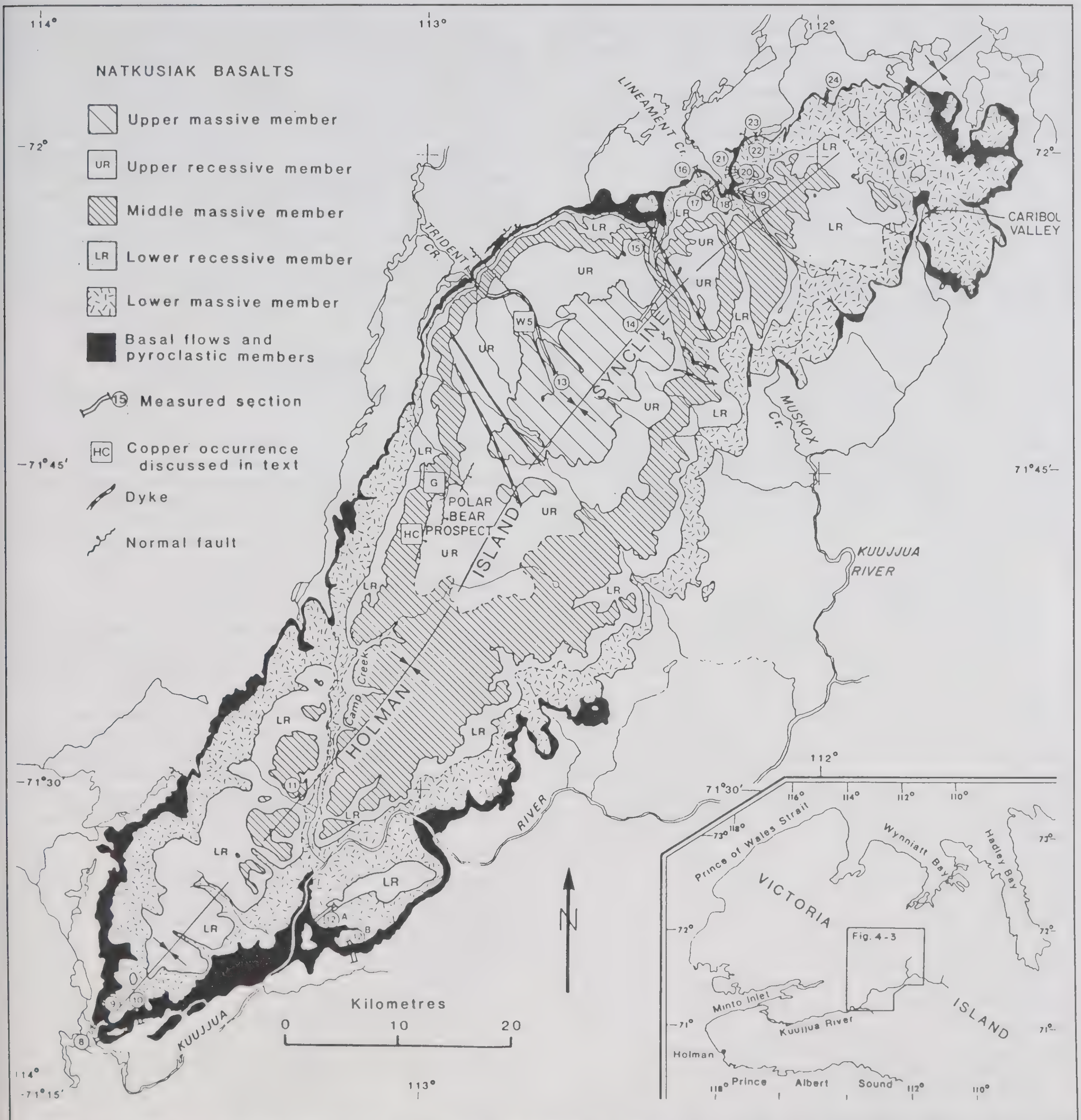


FIGURE 4-3: Geological map of Natkusiak basalts in the northeast sector of Holman Island Syncline. Copper showings are shown by letter (W5, G, HC). Numbers refer to measured sections (from Jefferson et al., 1985).

DESCRIPTION

The Natkusiak Formation, as defined by Thorsteinsson and Tozer (1962, p. 37) is a sequence of volcanic rocks comprising dark-coloured, basaltic flows and pyroclastic sediments. This formation rests disconformably on the Kuujjua and Kilian formations of the Shaler Group and includes the youngest Precambrian layered rocks in the area. The Natkusiak Formation is confined to Victoria Island, where it is exposed in two detached belts along the axis of the Holman Island Syncline. Landsat images clearly show a series of northwest-trending fractures that extend great distances into the Paleozoic sediments.

The formation is named for Natkusiak, late resident of Holman and well-known travelling companion of Arctic explorer Vilhjalmur Stefansson. Natkusiak's grave is in the Holman cemetery. The type section of the Natkusiak Formation is some 25 km south of Glenelg Bay, northern Victoria Island.

The formation attains a maximum thickness of about 300 m at about longitude 112°30'W. Where individual flows have been recognized, they are about 30 m thick. Amygdules commonly characterize the lower and upper parts of flows, whereas the middle section is dense basalt. Red and green agglomerate, commonly poorly indurated and cut by thin veins of calcite, is locally present at the base of the formation and ranges to 100 m in thickness. The agglomerate comprises fragments of volcanic rocks, bombs, and baked sedimentary rocks of various types that are embedded in a matrix of calcite and tuff. The volcanics are commonly chloritized and epidotized.

Baragar (1976, 1977) measured several sections of Natkusiak Formation volcanics for detailed geochemical and paleomagnetic studies. He related them to the Franklin magmatic province (or Franklin Magnetic Interval) of late Hadrynian time (600 Ma). They are the only known surface eruption of this event that also includes the Coronation dolerite sills and sheets (Christie, 1964) and the Franklin diabase dykes.

> The Natkusiak basalts are typical plateau basalts which have erupted, for the most part, in a subaerial environment. Each flow comprises a massive base, with the exception of a thin amygdaloidal zone at the bottom, and highly amygdaloidal top (Baragar, 1976, p. 350).

The Natukusiak Formation contains copper-bearing flood basalts similar to those of the Coppermine River area and the Keeweenawan Peninsula of Upper Michigan. Reconnaissance prospecting in the late sixties resulted in the discovery of more than 100 showings of chalcocite, bornite, malachite, azurite, chalcopyrite and native copper (Thorpe, 1972, p. 142).

Newbury (1969) studied the copper showings of claims on the southwestern block of Natkusiak Formation (Diamond Jenness Peninsula). He described epigenetic native copper in permeable zones, prehnite-bearing vugs, amygdules and fractures. Chalcocite apparently formed at a water table from vadose copper-bearing fluids.

Jefferson *et al.* (1985) subdivided the Natkusiak Formation into six litho-stratigraphic members. Jefferson (1985) defined a sixth, uppermost unit of the Shaler Group, the Kuujjua Formation. The Kuujjua Formation is a distinctive quartzarenite that is restricted to the southwest half of the Holman Island Syncline area. It unconformably overlies the Kilian Formation and is in turn unconformably overlain by the Natkusiak Formation.

Jefferson (1985) also noted that the evaporites, sabkha limestones and dolostones of the upper Kilian Formation are lithologically similar and time equivalent to the Thundercloud Formation of the Mackenzie Mountains. However, evaporites and red alluvial mudstones of the Redstone River Formation, which overlies the Thundercloud Formation, appear to have no counterparts on Victoria Island. In addition, there are several other variations in the geology of the two areas (Jefferson, 1985, p. 108-109).

CURRENT WORK AND RESULTS

In July 1986, Noranda Exploration Co. Ltd. prospected and tested several geophysical techniques over the Holy Cow showing on Prospecting Permit 991 (HC in Fig. 4-3). In all, six geophysical techniques were used to test the tonnage potential of the copper mineralization: small coil EM systems (EM-31D and Apex double dipole), VLF EM, Maxmin II, equipotential (mise à la masse) and magnetics.

The mise à la masse survey was the most useful in determining the extent of the exposed copper mineralization. Copper mineralization was traced over a short strike length using this technique. The EM systems failed to define any bedrock conductors of interest. The magnetic survey produced an 'egg carton'-type surface. Almost all of what had been originally perceived as *in situ* copper showings turned out to be float. This is also the case in the area of the Genesis showings (G in Fig. 4-3), however, they may have been 2 or 3 km south-west of the 'main Genesis showing'.

CENTRAL ARCTIC: CORNWALLIS LEAD-ZINC DISTRICT

The Cornwallis Lead-Zinc District (Kerr, 1977b) is a 125 by 275 km area that corresponds to the northern Boothia Uplift and comprises Cornwallis Island, eastern Bathurst Island, most of Grinnell Peninsula, northwestern Devon Island, as well as several smaller islands, including Little Cornwallis and Truro islands. The most recent geological map of this area is by Thorsteinsson (1986).

In Late Cambrian to late Middle Ordovician time, the area formed part of the Franklinian Shelf (or miogeocline), which received mainly carbonate sediments (Cass Fiord, Cape Clay, Eleanor River, Thumb Mountain and Irene Bay formations) (Table 4-2), but also subtidal evaporites of late Early and early Middle Ordovician age (Baumann Fiord and Bay Fiord formations). A different facies configuration existed from Late Ordovician to earliest Devonian time: downwarping of outer parts of the shelf resulted in the deposition of slope and basin deposits (graptolitic shales and carbonates of Cape Phillips Formation) in northern and western parts of the area, while shelf carbonate deposition (Allen Bay Formation and Read Bay Group) continued in southern and eastern parts.

The Cornwallis Disturbance affected northern parts of the Boothia Uplift in Early Devonian time (Kerr, 1977a). Faulting of the crystalline basement along northerly trends caused faulting and folding of the lower Paleozoic cover. After an interval of uplift and erosion, the northern Boothia Uplift was unconformably overlapped by strata of the upper Lower Devonian Disappointment Bay Formation. The syntectonic and post-tectonic deposits of this unit are overlain by a thick platformal carbonate and clastic succession of latest Early Devonian to Late Devonian age (Blue Fiord Formation, Okse Bay Group, etc.). The Ellesmerian Orogeny of latest Devonian-Early Carboniferous age probably caused minor faulting only. The post-Devonian stratigraphic record is restricted to local outcrops of Carboniferous, Cretaceous and Tertiary strata, the latter two preserved in Tertiary grabens.

TABLE 4-2: FORMATIONS OF CORNWALLIS AND ADJACENT ISLANDS (from Thorsteinsson, 1986).

DEVONIAN

MIDDLE AND UPPER DEVONIAN

HECLA BAY FORMATION: Sandstone (?1000m)

MIDDLE DEVONIAN

BIRD FIORD FORMATION: Siltstone; sandstone; shale; minor limestone (175-225m)

Unnamed formation: limestone; minor dolomite and shale (20-100m)

LOWER DEVONIAN

DISAPPOINTMENT BAY FORMATION: dolomite; minor limestone, siltstone, shale, sandstone, conglomerate and gypsum (20-200m)

Unnamed formations: D-cg: dolomite-and-limestone conglomerate (0-70m) D-ss: sandstone; siltstone; minor conglomerate and limestone (0-50m)

SNOWBLIND BAY FORMATION: limestone-and-dolomite conglomerate; dolomite; limestone; siltstone; sandstone (+580m)

SOPHIA LAKE FORMATION: limestone; minor dolomite, siltstone, sandstone, shale and conglomerate (500-980m)

> **LOWER DEVONIAN**
>
> **BATHURST ISLAND FORMATION:** sandstone; siltstone; limestone; shale (?450m)

SILURIAN AND DEVONIAN

UPPER SILURIAN AND LOWER DEVONIAN

BARLOW INLET FORMATION: limestone; dolomite; minor shale, siltstone and sandstone (1410m)

SILURIAN

UPPER SILURIAN

DUORO FORMATION: limestone; dolomite; minor siltstone and shale (334-460m)

CAPE STORM FORMATION: dolomite; dolomitic limestone; limestone; minor siltstone and shale (520-670m)

ORDOVICIAN AND SILURIAN

UPPER ORDOVICIAN TO UPPER SILURIAN

ALLEN BAY FORMATION: dolomite; minor limestone and shale (1200-1375m)

> **UPPER ORDOVICIAN TO UPPER SILURIAN**
>
> **CAPE PHILLIPS FORMATION:** limestone; siltstone; dolomite; shale; minor chert (3000m in southeast, probably not more than 600m in northwest)

ORDOVICIAN

UPPER ORDOVICIAN

IRENE BAY FORMATION: shale; minor limestone (30-45m)

MIDDLE AND UPPER ORDOVICIAN

THUMB MOUNTAIN FORMATION: limestone; dolomite; minor shale (340m)

MIDDLE ORDOVICIAN

BAY FIORD FORMATION: limestone; dolomite; minor shale, gypsum, anhydrite and solution breccia (440m)

LOWER AND MIDDLE ORDOVICIAN

ELEANOR RIVER FORMATION: limestone; minor dolomite and intraformational conglomerate (700m)

LOWER ORDOVICIAN

BAUMANN FIORD FORMATION: gypsum; anhydrite; minor limestone and intraformational conglomerate (750m)

Unnamed formation: limestone; minor sandstone, anhydrite and siltstone (290m)

CAPE CLAY FORMATION: limestone (87m)

CAMBRIAN AND ORDOVICIAN

MIDDLE CAMBRIAN TO LOWER ORDOVICIAN

CASS FJORD FORMATION: shale; limestone; minor sandstone, siltstone and anhydrite (+2177m)

INTRUSIVE ROCKS

ORDOVICIAN

Diapiric gypsum, anhydrite (The Bay Fiord Formation or the Baumann Fiord Formation are the most probable source of these rocks)

CONTROLS ON MINERALIZATION

A number of empirical controls or guides to mineralization have been developed that account for most of the 15 known MVT showings in the region. Most of the showings, including the three main deposits, are in the upper bioclastic part of the Ordovician Thumb Mountain Formation (Kerr, 1977b). The country rock is invariably brecciated dolomite; secondary sparry dolomite veining referred to as 'pseudobreccia' is common. Most of the showings are within the bounds of the Cape Phillips Formation shale basin and are structurally higher, but stratigraphically lower, than the shale. In most cases where stratigraphic relationships can be determined, the showings are in areas where the Thumb Mountain Formation is unconformably overlain by the Disappointment Bay Formation. Solution and collapse features related to this surface may have provided structures for the transport and deposition of ore fluids (Kerr, 1977b).

A fifth control may be northerly trending, basement-controlled faults or fractures and anticlines related to development of the Boothia Uplift. Kerr (1977b) noted that the Thumb Mountain Formation was exposed during the Cornwallis Disturbance only where erosion cut deeply, primarily into anticlines, like the Crozier Strait Anticline.

In 1985 and 1986, mineral exploration was limited to drilling in the vicinity of the Polaris Mine (see Chapter 2 or Gibbins, 1990). Much of this was surface drilling designed to test the South Keel Zone for southern extensions. Some new ore was identified because ore reserves decreased by only 2.2 Mt despite 1 Mt mined and 2.7 Mt removed to account for probable losses in pillars (Cominco Annual Report, 1987).

Recent drill programs involved: 12 800 m (120 holes) in 1984, 9200 m (80 holes) in 1985, 10 050 m (73 holes) in 1986, and 15 800 m (102 holes) in 1987.

BORDEN BASIN-BORDEN PENINSULA, BAFFIN ISLAND

Borden Peninsula, part of northern Baffin Island, is 500 km north of the Arctic Circle. The Nanisivik Lead-Zinc-Silver District, hosted in the Society Cliffs Formation, is bounded by the Strathcona Sound and Adams Sound grabens and extends from Admiralty Inlet on the west to beyond Milne Inlet in the east-southeast (Fig. 4-4).

Most of Borden Peninsula is underlain by Neohelikian shales, quartzarenites, greywackes, arkoses, conglomerates and carbonates (Table 4-3). The carbonates commonly contain stromatolites or bioherms or both. About 90 to 150 m of tholeiitic plateau basalt is near the base of the sequence. Faulting occurred during deposition that took place in a southeasterly trending rift zone.

A complex assemblage of Aphebian-Archean gneisses is separated from the overlying Neohelikian strata by a nonconformity. A thin regolith is developed in a few places on the gneisses, which are commonly stained red for several metres below the nonconformity (Jackson *et al.*, 1978, p. 3).

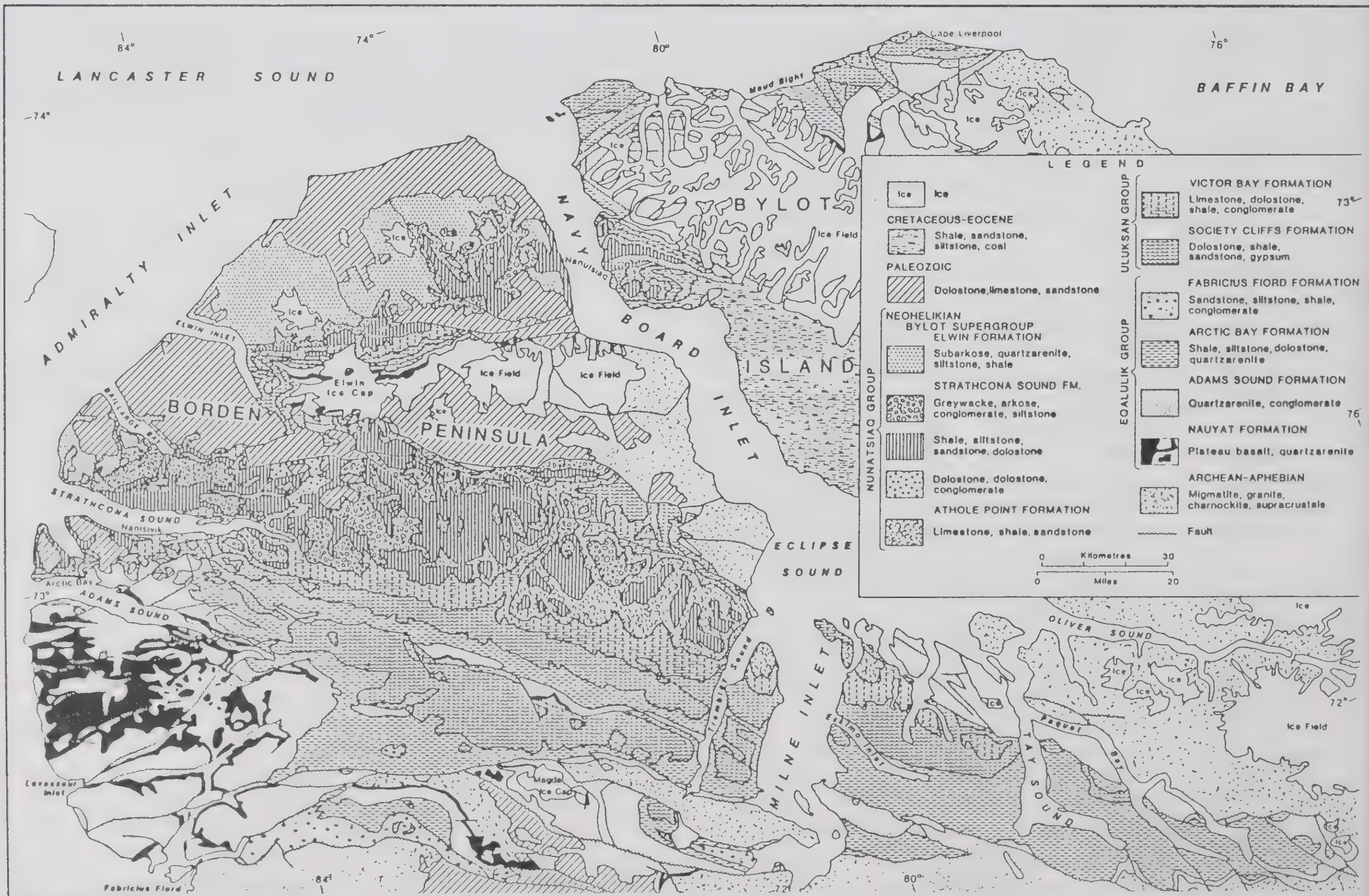


FIGURE 4-4: Geology of the Borden Basin (from Jackson and Iannelli, 1981).

Mississippi Valley-type zinc-lead deposits are hosted by the Society Cliffs Formation at Nanisivik, Hawker Creek and elsewhere on Borden Peninsula. The Society Cliffs Formation is characterized by thick to massive beds of regularly laminated, brownish-grey to grey stromatolitic dololutite and dolosiltite. Planar stromatolites are ubiquitous; low domal varieties are common and cabbage-head types are less common (Jackson *et al.*, 1978). Society Cliffs strata are shallow, subtidal to intertidal in origin. A strong, fetid, petroliferous odour is normally given off by freshly broken rock. Dolomite breccia is common and some of this brecciation can be related to early karsting (Olson, 1984; Geldsetzer, 1973a,b).

Hadrynian diabase (Franklin Intrusions, Table 4-3) intrudes other known Precambrian rocks in the area including massive sulphide deposits. Remnants of flat-lying Paleozoic sandstones and dolomite extend onto Borden Peninsula from adjacent parts of Baffin Island.

Papers by Jackson and Iannelli (1981) and Jackson, Iannelli and Tilley (1980) give the most recent geological synthesis of the region.

TABLE 4-3: TABLE OF FORMATIONS, BORDEN BASIN (from Jackson and Iannelli, 1981).

		GP		
HADRYNIAN			Franklin Intrusions: Diabase	
			Intrusive Contact	
NEOHELIKIAN	BYLOT SUPERGROUP	NUNATSIAQ	Elwin Fm. (470-1220 m):	EL_1: Quartzarenite, siltstone EL_2: Sandstone, siltstone, dolostone
			Gradational	
		NUNATSIAQ	Strathcona Sound Fm: (430-910 m+)	SS_6: SS_{1-5} lithologies interbedded SS_5: Polymictic conglomerate SS_4: Siltstone, greywacke SS_3: Arkose-greywacke, shale SS_2: Dolostone, dolostone conglomerate SS_1: Shale, siltstone
			Gradational	
		NUNATSIAQ	Athole Point Fm: (0-585 m) Limestone, sandstone, shale	
			Gradational	Gradational to Unconformable
		ULUKSAN	Victor Bay Fm: (156-735 m)	VB_2: Limestone, dolostone, flat pebble conglomerate VB_1: Shale, siltstone, sandstone, limestone
			Conformable, Abrupt to Gradational	
		ULUKSAN	Society Cliffs Fm: (263-856 m)	SC_2: Stromatolitic & massive dolostones SC_1: Stromatolitic dolostone, shale, sandstone, gypsum
			Chiefly Unconformable?	Gradational to Unconformable
		EQALULIK	Fabricius Fiord Fm: (400-2000 m+) FF_4: Arkose, conglomerate, dolostone FF_3: Subarkose, conglomerate FF_2: Shale, quartzarenite FF_1: Quartzarenite, shale	Arctic Bay Fm: (180-770 m) AB_4: Shale, dolostone AB_3: Shale, siltstone AB_2: Shale, quartzarenite AB_1: Siltstone, quartzarenite
			Conformable, Abrupt to Gradational	
		EQALULIK	Adams Sound Fm: (0-610 m) AS_3: Quartzarenite, conglomerate, shale AS_2: Quartzarenite AS_1: Quartzarenite, conglomerate	AS_U: Quartzarenite AS_L: Quartzarenite, conglomerate
			Conformable	
		EQALULIK	Nauyat Fm: (0-430 m)	NA_2: Plateau basalt NA_1: Quartzarenite, subarkose, basalt
			Nonconformity	
ARCHEAN-APHEBIAN			Gr nitic gneiss basement complex: Migmatite, foliated granitic rocks, granite, charnockite, supracrustal relics	

SUMMARY OF RECENT MINERAL EXPLORATION

Mineral exploration in the Borden Basin has been mainly for Mississippi Valley-type lead-zinc deposits in the Society Cliffs Formation dolomite (Nanisivik Mines Ltd.) and for shale-hosted lead-zinc deposits in the Arctic Bay and Victor Bay formations.

In 1981, Nanisivik Mines Ltd. began regional exploration of the area underlain by Society Cliffs Formation by contracting Aerodat Ltd. to fly 5352 line-km of helicopter-borne magnetic, electromagnetic and VLF EM survey and Paterson, Grant and Watson Ltd. to compile and interpret this data. Some 150 EM and VLF EM conductors were identified as probably of bedrock origin and 74 of these were recommended for further investigation (Gibbins, 1984). Nanisivik Mines Ltd. obtained 14 prospecting permits in February 1982 to protect areas of interest.

In 1983, a Petro-Canada Ltd. subsidiary, 103912 Canada Inc., obtained 12 prospecting permits (957-968) that mainly include areas underlain by Arctic Bay Formation shales. In 1985, they obtained three more permits (P.P. 1044-1046) near Elwin Inlet. Nanisivik Mines Ltd. relinquished 13 of 14 prospecting permits at the beginning of 1984 and Petro-Canada Ltd. relinquished 9 permits (P.P. 957-965) at the beginning of 1985.

In 1982-83, Nanisivik Mines Ltd. did geochemical and geophysical surveys, geological mapping and prospecting in areas deemed to have favourable mineral potential (Gibbins, 1985, p. 123-132). Some of these areas were drilled in 1984. In 1985, Nanisivik Mines Ltd. concentrated on geophysical survey west and south of the mine area and geophysical surveys and drilling in the mine area. Nanisivik Mines Ltd.'s exploration budget for 1982-1985 was more than $5 million.

In 1984, Petro-Canada Ltd. completed geochemical and geological reconnaissance of their permit areas in the Arctic Bay Formation shales. In 1985, they concentrated on mapping and testing a silver-galena-barite showing near the head of Elwin Inlet.

In 1986 and 1987, Nanisivik Mines Ltd. carried out extensive drilling projects in the area of the Nanisivik Mine (Fig. 4-5). A total of 236 surface drill holes (20 950 m) were drilled on the DEB Zone, North Grid, Shale Hill, K-baseline, Area 14 NW and Oceanview-TGS #2 areas in 1966 at a cost of 1.7 million dollars. In 1987, 189 holes (12 700 m) were divided between surface drilling on the West Grid, Oceanview, Shale Hill, DEB east, and South Boundary Zone West areas and underground drilling, mainly in the Central Lower Lens of the Nanisivik Deposit. The 1986 and 1987 exploration has been successful to the extent that most of the ore mined in this period from the proven and probable ore reserve has been replaced (see Chapter 2).

NANISIVIK WEST PROJECT

Nanisivik Mines Ltd.	Zinc, Lead
12th Floor, 20 Toronto St.	48 C/1
Toronto, Ont., M5C 2B8	73°00-05'N
	84-85°W

REFERENCES

Blackadar *et al.* (1968); Geldsetzer (1973a, 1973b); Gibbins (1984, 1985, 1987); Gibbins *et al.* (1977); Jackson *et al.* (1978); Lemon and Blackadar (1963).

DIAND assessment reports: 082085 (Geophysics), 082074, 082085, 082110, 082111, 082112 (Drilling).

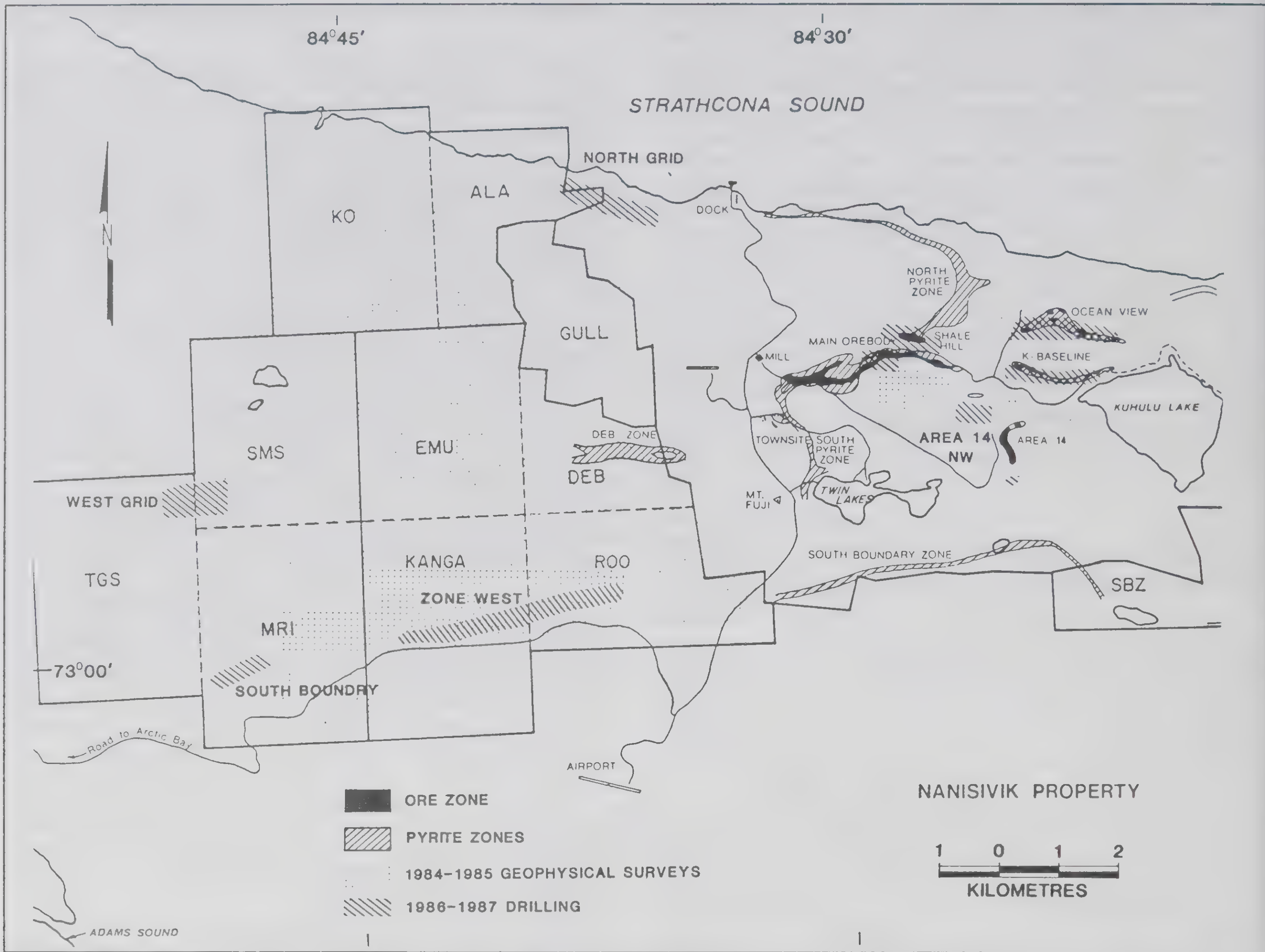


FIGURE 4-5: Sulphide zones and mineral claims, Nanisivik, NWT (modified from Nanisivik Mines Ltd. Annual Report 1985).

PROPERTY

Original block: GULL, DEB, EMU, KANGA, ROO
West block: TGS, MRI, SMS
North block: KO, ALA.

LOCATION

The claims adjoin the Nanisivik Mine property. They extend westerly from a point 2 km southwest of the Nanisivik townsite to 15 km southwest of the town, about half-way to the community of Arctic Bay (Fig. 4-5). The area is bordered on the north by Strathcona Sound and on the south by the Arctic Bay road.

HISTORY

The GULL claims were staked in 1972 to protect possible westward extensions of the Nanisivik deposit. Geological and VLF EM surveys were done on the claims in 1974 (Gibbins *et al.*, 1977). In 1976, a McPhar SS-15 system (vertical loop EM) detected several weak, unexplained anomalies.

In 1981, a regional geophysical survey of the area, comprising magnetic, coplanar and coaxial EM and two channels of VLF EM, was flown (Gibbins, 1984). The DEB claim was staked in 1982 to cover an airborne-detected anomaly (6-A2-4) south of the GULL claims.

In 1982, VLF EM, Max-Min EM, IP and magnetometer surveys on the DEB and the southeast corner of the GULL claims were designed to check for possible extensions of a strong conductor on the RAVEN claims just east of the GULL claims. The results were consistent with shallow conductive overburden. The magnetometer survey did not indicate any magnetic bodies (i.e., gabbro dykes).

Exploration on the nearby RAVEN claims led to discovery of dolostone of the Society Cliffs Formation in the southeast corner of the GULL claim group. This indicated that the southern part of the group probably has only a thin cover of shale and glacial drift and may be considered for exploration for massive sulphides within the Society Cliffs Formation.

Because of the favourable location and geology, Turam and IP surveys of the DEB and the adjacent RAVEN claims were extended into the GULL claims in 1983, despite the fact that previous geophysical surveys (VLF and vertical loop EM) did not yield indications of conductive sulphide minerals (Gibbins, 1985). The Turam EM Survey outlined two strong conductors

extending up to 1500 m in an easterly direction at an interpreted depth of 100 km.

The geology of the GULL-DEB-RAVEN area was mapped in September 1983 by R. von Guttenburg of Metallgesellschaft Canada Ltd.

The remaining claims were staked during the summer of 1984. The GULL claims were permitted to lapse in November 1985 and were restaked in January 1986.

The McPhar GEM 8 system was chosen for 1984-85 reconnaissance geophysical surveys because it provides the deep penetration needed to identify massive sulphides like the DEB Zone. Interesting areas are then tested with closer spaced VLF EM, magnetometer and GEM 8 broadside surveys. In 1984, geophysical work consisted of reconnaissance and follow-up of the original block (DEB, EMU, KANGA and ROO claims), and reconnaissance of the western block (TGS, SMS and MRI). This work was contracted to Patterson, Grant and Watson Ltd. (DIAND assessment report 082085).

Early in 1984 (May and April), 18 holes (2882 m) outlined two east-trending lenses of massive pyrite at the Victor Bay Formation-Society Cliffs Formation contact. These lenses are known as the DEB Zone (Fig. 4-5). Two of these holes tested a 1983 IP anomaly just east of the DEB Zone, but no sulphides were found at the contact.

Late in 1984, 15 holes (2650 m) were drilled in 6 areas to test 10 anomalies. Karst-related oxidation, limonite-staining, dissolution and resedimentation were encountered in every area. Hematite mud in enlarged fractures and karst tubes probably accounts for most of the geophysical anomalies. Area 1 is south of Mount Fuji (LION 14 claim, Mineral Lease 2810). Here, the conductor is coincident with a fault that is down dropped at least 100 m on the west side. Specks and blebs of sphalerite were found in one hole. Anomalous areas 2 (ROO claims) and 3 (DEB claims) appear to be due to pyrite veinlets in Society Cliffs Formation dolostones. In Area 5 (EMU claim), the anomaly is caused by pervasive oxidation of collapsed dolostone shown by red hematite alteration and staining on fractures and clay zones. Areas 4 and 6 (MRL claim) appear to represent a westward extension of the South Boundary Zone, but unfortunately, the drills did not get through the overburden.

In 1985, the sequence of geophysical work was: follow-up on the western block, follow-up on the DEB claims, reconnaissance of the north block (KO and ALA claims) and follow-up of the north block.

Only one hole was drilled on these claims in 1985 as most of the 1985 drilling was done on targets in the immediate vicinity of the mine (Chapter 2). The single hole tested a geophysical anomaly on the GULL claims (Gibbins, 1987).

DESCRIPTION

The region is underlain by a sequence of Helikian sediments that are generally flat lying but commonly block faulted. The most recent regional geological maps are those of Blackadar *et al.* (1968) and Lemon and Blackadar (1963). However, the Geological Survey of Canada has done additional mapping in the area since 1977 (Jackson *et al.*, 1978).

THe GULL claims are underlain by dolomitic shales of the lower Victor Bay Formation and dolomite of the middle Victor Bay Formation. Society Cliffs Formation dolomite, which normally underlies the Victor Bay Formation and hosts the lead-zinc deposit at Nanisivik (Gibbins *et al.*, 1977), outcrops only in the southwest corner of the claims. Earlier geological mapping and drilling to the east of the claims suggested it is present at a depth greater than 120 m. Almost 450 m of Society Cliffs Formation has been measured in the region; thus it was expected to underlie the claims at depths between 120 and 670 m. However, it is now known to be closer to surface, even though extensive pre-Victor Bay karsting in the area prior to the deposition of Victor Bay Formation shales (Geldsetzer, 1973a, 1973b) may have removed some of the Society Cliffs Formation.

Northwest-trending diabase-gabbro dykes intrude the Victor Bay and Strathcona Sound formations in adjacent areas.

CURRENT WORK AND RESULTS

In 1986, numerous holes were drilled in the DEB zone (Fig. 4-5), and seven holes were drilled in the DEB EAST area in 1987. Also in 1987, three holes were drilled in the West Grid area (TGS and SMS claims) and two holes in the South Boundary Zone West (MRI, KANGA and ROO claims, Fig. 4-5). Economic sulphide minerals were not encountered in these areas.

MELVILLE PENINSULA

Mapping by Heywood (1967, 1974) and others (Henderson, 1983; Schau, 1984) shows that most of Melville Peninsula is underlain by Archean gneisses, migmatites and foliated to massive granitoid rocks. Among the oldest rocks of the region are folded and metamorphosed sedimentary and volcanic rocks of the Prince Albert Group. These supracrustal rocks are distributed in two major northeast-trending belts up to 20 km wide and at least 280 km long. In the central part of Melville Peninsula there are clastic metasedimentary rocks derived mainly from greywacke and interbedded with felsic to mafic metavolcanic rocks, with local komatiite or ultrabasics and iron formation.

A younger, Aphebian or Early Proterozoic sequence of supracrustal rocks, the Penrhyn Group, is widely distributed in the southern third of Melville Peninsula. These supracrustal rocks form northeast-trending belts separated by bands of Archean gneiss. The group is a lithologically varied sequence of pelitic and psammitic gneiss, calcium silicate gneiss, marble, quartzite and amphibolite. The Penrhyn Group is complexly folded. Textures and mineral assemblages indicate that Penrhyn Group paragneiss was subject to upper amphibolite-grade regional metamorphism after the last penetrative deformation event (Henderson, 1983, p. 10).

Along the west coast of Melville Peninsula, near Mackar Inlet, an 800 m thick sequence of weakly metamorphosed arkose and minor phyllite, conglomerate and marble rests unconformably on a metamorphosed regolith developed on Archean basement. Frisch (1982) named this sequence the Folster Lake Formation. Maurice (1979) investigated anomalously high uranium in lake sediment and water samples in this area, found that the granitic rocks are enriched in uranium, particularly near the unconformity, and concluded that this unconformity is an attractive target for uranium exploration.

Much of southern Melville Peninsula was covered by a National Geochemical Reconnaissance survey of lake sediments and waters (Geological Survey of Canada, 1978a, 1978b, 1981b) and an airborne radiometric survey under the aegis of the Uranium Reconnaissance Program (Geological Survey of Canada, 1979). Follow-up work by Cameron (1979) identified strong and coincident zinc and nickel anomalies related to sulphidic-graphitic paragneiss of the Penrhyn Group. Maurice (1979) noted that the lake sediment results show high

uranium contents and particularly so for areas underlain by Penrhyn Group rocks.

Iron formation of the Prince Albert Group is widespread, thick and extensive (Shau, 1984) and can be readily traced on aeromagnetic maps. It consists mainly of magnetite and quartz with minor pyrite, hematite and carbonate; some sections average as much as 30% iron. Rusty-weathering zones or gossans, commonly containing disseminated sulphides, are present in many parts of the regions. Most are associated with the metavolcanic rocks of the Prince Albert Group.

The iron formation was systematically explored and staked by Borealis Exploration Ltd. in the summers of 1969 and 1970 (Wilson and Underhill, 1971; Laporte, 1974a). In 1982, Borealis Exploration Ltd. tested the A and B deposits near Roche Bay with 3500 m of drilling in anticipation of bringing the deposits into production. In 1983, trace amounts of gold and silver were detected in samples being tested for metallurgical purposes, and the 1982 core was relogged and sampled for gold (Gibbins, 1985, p. 135). Aquitaine Company of Canada Ltd. explored 24 prospecting permits in Southern Melville Peninsula between 1970 and 1973. Aquitaine's work included several thousand line kilometres of airborne magnetic, EM and radiometric surveys (Laporte, 1974a, 1974b; Padgham *et al.*, 1976).

Cominco Ltd. and Noranda Exploration Ltd. did some mineral exploration on Melville Peninsula in 1979 and 1980 respectively (Gibbins, 1983, 1984). However, Melville Peninsula has not been the scene of many major mineral exploration projects.

Between 1983 and 1985, Borealis Exploration Ltd. was granted 25 prospecting permits in Central Melville Peninsula. These permits were prospected on an 'airborne' reconnaissance level in 1984 and 1985 (Gibbins, 1987). The main target in the northern group (NTS 47 A, B) was gold in iron formation of the Prince Albert Group. In the southern group of permits (NTS 46 N, O, P), gossans and geochemical anomalies in supracrustal rocks of the Penrhyn Group are believed to have gold and base metal potential.

All but 6 of the 25 permits were allowed to lapse at the end of 1985. The remaining 6 permits have since lapsed.

PROSPECTING PERMIT 911

Borealis Exploration Ltd.	Gold
1700 Aquitane Tower	47 A/5 SE
540 5th Ave. SW	68°15'-68°30'N
Calgary, Alta., T2P 0M2	83°-89°W

REFERENCES

Heywood (1967); Schau (1984); Gibbins (1987).

DIAND assessment reports: 082421 (1986), 081766 (1985).

PROPERTY

Prospecting Permit 911.

LOCATION

Prospecting Permit 911 is in central Melville Peninsula, 15 to 55 km west of Roche Bay and 70 to 110 km east of Mackar Inlet.

HISTORY

The permit was granted in February 1983. NTS area 47 A/5 was previously covered by Prospecting Permit 58, granted to Borealis Exploration Ltd. in 1968.

Samples collected during 1984 and 1985 from pods of disseminated to massive arsenopyrite and pyrite in banded magnetite and sulphide-facies iron formation contained gold (Gibbins, 1987).

DESCRIPTION

The area is underlain by a greenstone belt of the Prince Albert Group (Heywood, 1967; Schau, 1984).

CURRENT WORK AND RESULTS

In 1986, exploration failed to establish continuity between the known gold anomalies. All but one of twelve samples assayed less than 0.01 g/t Au. Nickel (maximum 0.013%) and zinc assays (maximum 0.068%) are considered insignificant.

The permit lapsed in 1988.

PROSPECTING PERMIT 1001

Borealis Exploration Ltd.	Gold
1700 Aquitane Tower	47 A/11 SW
540-5th Ave. SW	68°40'N
Calgary, Alta., T2P OM2	82°45'W

REFERENCES

Gibbins (1987); Schau (1984).

DIAND assessment reports: 082421 (1986), 081767, 081964 (1984/85).

PROPERTY

Prospecting Permit 1001.

LOCATION

Prospecting Permit 1001 is 60 km west of Hall Beach. It includes the westernmost shore of Hall Lake and adjacent area.

HISTORY

The permit was granted February 1, 1984. A number of gossans were found in Prospecting Permit 1001 during an aerial reconnaissance survey in 1984. Gold is associated with sulphide-facies iron formation and arsenopyrite. Detailed work in 1985 showed that there are two types of sulphide mineralized showings. The first is disseminated arsenopyrite and pyrite in silicate-facies iron formation and narrow, discontinuous, silicified gossan zones in basalt. The second is pods of massive arsenopyrite within and along contacts of oxide-facies iron formation. Several grab samples from these 1 to 3 m wide pods assayed from 144 to 1380 ppb Au (Gibbins, 1987).

DESCRIPTION

The area is underlain by Prince Albert Group metavolcanic rocks (Shau, 1984). The permit area is at the northeastern end of the eastern block of Prince Albert Group metavolcanics where the normal northeast trend is deflected northerly and even north-northwesterly. The area has undergone intense deformation and metamorphism.

CURRENT WORK AND RESULTS

In 1986, two traverses and eleven grab samples in an area southwest of the 1984-85 work failed to find gold. One sample, containing 20% pyrite and pyrrhotite, assayed 0.11% nickel.

Permit 1001 lapsed in 1989.

PROSPECTING PERMITS 1064 AND 1065

Borealis Exploration Ltd.	Zinc, Nickel
1700 Aquitane Tower	46 N/1
540 5th Ave. SW	67°7.5'-67°15'N
Calgary, Alta., T2P OM2	84°-84°30'W

REFERENCES

Cameron (1979); Geological Survey of Canada (1978a, 1978b); Henderson (1983); Laporte (1974a).

DIAND assessment reports: 082422 (1986), 081961 (1984/85).

PROPERTY

Prospecting Permit 1064 (46 N/1 NE).
Prospecting Permit 1065 (46 N/1 NW).

LOCATION

The permit area is in central southern Melville Peninsula, 16 to 28 km north of the northeast end of Lyon Inlet and 105 to 120 km northeast of the community of Repulse Bay.

HISTORY

NTS area 46 N/1 was covered by Prospecting Permit 180 issued to Aquitaine Company of Canada Ltd. between 1970 and 1972. They identified anomalous radioactivity in the southern half of the area (Laporte, 1974a, p. 123-125).

In 1977, a regional lake sediment geochemical survey outlined a number of zinc anomalies in the permit areas (Geological Survey of Canada, 1978a, 1978b). In 1978, Cameron (1979) conducted detailed follow-up work in several of these areas, tracing anomalous base metal readings to their sources by sampling surface waters. He outlined two areas that have high zinc and nickel content.

Prospecting Permits 1064 and 1065 were granted February 1985.

Field work in 1985 was largely confined to the southeast quarter of Prospecting Permit 1064 and the northwest corner of Prospecting Permit 1065 where Cameron (1979) had identified zinc and nickel anomalies in surface water.

Samples of pelitic gneiss from Prospecting Permit 1064 were not enriched in base metals. This was not surprising because, as Cameron (1979) pointed out, recent oxidation would have removed any base-metal sulphide minerals from the surface. Several soil samples from Permit 1064 did contain anomalous concentration of zinc and nickel. The highest assay was 6200 ppb Zn, 2850 ppb Ni and 248 ppb Co.

A soil geochemistry survey of the northwest corner of Prospecting Permit 1065 confirmed the zinc and nickel anomalies of Cameron (1979). One sample assayed 4400 ppb Zn and 1160 ppb Ni. The next best sample contained less than 500 ppb Zn.

DESCRIPTION

The area is underlain by Penrhyn Group supracrustal rocks and Archean granite to granodiorite gneisses (Henderson, 1983).

CURRENT WORK AND RESULTS

In 1986, two grids were established in Prospecting Permit 1064 and one grid in Prospecting Permit 1065. These grids are centred on zinc anomalies discovered by Cameron (1979). Detailed mapping at 1:2000 scale, and rock and soil geochemistry were done on the grid areas. Samples were analyzed for gold, silver, cobalt, nickel, lead and zinc. In addition, Bloom field-test kits were used to test for zinc in water samples.

Rusty pelitic gneiss underlies the main area of interest on both the east and centre grids in Permit 1064. Five areas of anomalous zinc content, corresponding to rusty pelitic gneiss, were defined in Permit 1065. The best assay, 3.3 g/t Au, was for a sample from the east grid.

Drilling to test for 'possible massive sulphide mineralization' in rusty pelitic gneiss was recommended for all three grids. However, the permits were allowed to lapse in 1988.

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CHAPTER 5
KEEWATIN REGION

Kate Hearn
Research Geologist

INTRODUCTION

Mining and mineral exploration in the Keewatin Region during 1986-87 was monitored by District Geologist P.J. Laporte, who was succeeded by K. Griep in January, 1987. The Keewatin Region is the mainland area of the NWT east of 102°W and covers a portion of the Churchill Province. Consolidated rocks of the area comprise Archean volcanics and sediments, intruded and bordered by granitic and gneissic batholiths and migmatite terrain. Archean rocks are unconformably overlain by Aphebian metasedimentary and volcanic rocks which are preserved locally in downfaulted blocks. The rocks were regionally deformed and metamorphosed during the Proterozoic Hudsonian Orogeny. Intercratonic rifting during the Hudsonian Orogeny was accompanied by the deposition of Dubawnt Group sediments.

ECONOMIC GEOLOGY

The Churchill Province is recognized for its metallogenic association with polymetallic volcanogenic sulphide deposits, lode gold deposits, uranium deposits and nickel-copper deposits. Locations and summary details of mineral deposits significant with respect to possible development, or evaluation of regional mineral potential, are given in Figure 5-1 and Table 5-1.

The exploration focus in 1986-87 was on gold and uranium. Work continued on uranium targets defined in the late 1970s and early 1980s, while exploration for gold intensified. Increased interest in gold manifested as the highest number of hectares being staked since the end of the uranium boom in 1981.

Two projects were the subject of advanced exploration during 1986-87. Work on the Kiggavik Uranium Project (summarized in this chapter), included feasibility studies and continued definition drilling of the deposit. At the Fat Lake Gold Project (summarized in this chapter), definition drilling continued and underground exploration and bulk sampling was completed.

The 1986-87 exploration projects for the Keewatin Region have been grouped under three main headings, based on the geological setting. The headings are:

The Ennadai Lake - Rankin Inlet area.
The Baker Lake - Thelon area.
The Chantry Inlet - Wager Bay area.

Projects and areas are indicated on Figure 5-1 and listed in Table 5-1.

CARIBOU PROTECTION MEASURES

Exploration is constrained between May 15 and September 1 by the Caribou Protection Measures, a series of restrictions appended to the land use permits for the District of Keewatin. Protection measures were introduced in 1980 and have been summarized in previous Mineral Industry Reports (Laporte, 1984, 1985b, 1987).

ENNADAI LAKE - RANKIN INLET AREA

The Rankin-Ennadai belt comprises three separate but closely related east- to northeast-trending basins of Archean and Aphebian rocks. The basins coalesce to form a belt 380 km long. An east-trending Archean basin about 64 km wide occupies the northeastern portion of the belt shown in Figure 5-1 (Goodwin, 1973). Archean rocks are Kaminak Group volcanic flows and pyroclastics, slate, greywacke and conglomerate (Laporte, 1987) with abundant oxide-facies iron formation north of Kaminak Lake and local sulphide- and carbonate-facies iron formation in the immediate Kaminak Lake area (Goodwin, 1973). The Kaminak Group has been divided into one incomplete and four complete cycles of volcanism and a number of felsic volcanic centres with associated exhalite zones are recognized in the belt (Ridler and Shilts, 1974). Another basin, formerly considered to be Aphebian rocks of the Rankin Inlet area, is north of the main trend of the Rankin-Ennadai belt and has been redefined by Tella (1986) as Archean rocks recording two cycles of volcanism.

The Archean rocks are unconformably overlain by Aphebian rocks of the Hurwitz Group, consisting of conglomerate, greywacke, quartzite, orthoquartzite, argillite and dolomite, interbedded with and overlain by basaltic flows in the east (Laporte, 1987).

During the Hudsonian Orogeny, the assemblage was folded about northeasterly trending axes (Laporte, 1987). A relict zone of albite/epidote greenschist metamorphism (Kaminak Group), where Archean east-trending folds are preserved (Davidson, 1972), is flanked by higher metamorphic grades resulting from overprinting during the Hudsonian Orogeny (Ridler and Shilts, 1974).

Most exploration in 1986-87 concentrated on the gold potential of the Kaminak Group. Ridler and Shilts (1974) compared the Kaminak Lake area to the Noranda area of the Abitibi. Therefore, most exploration models used were derived from work in the Abitibi where mineral showings and ore deposits lie preferentially within volcanic complexes and are commonly associated with centres of felsic volcanism (Goodwin and Ridler, 1970).

ANT CLAIMS

Borealis Exploration Ltd.	Gold
960, 540 5th Ave. SW	55 K/7,2
Calgary, Alta., T2P 0M2	62°01'-62°29'55"N
	92°37'40"-92°48'55"W

REFERENCES

Heywood (1973).
DIAND assessment reports: 082416, 082486, 082523.

PROPERTY

ANT 1-4 (F12055-F12058).
ANT 5 (F12054).
SON 1 (F12060).

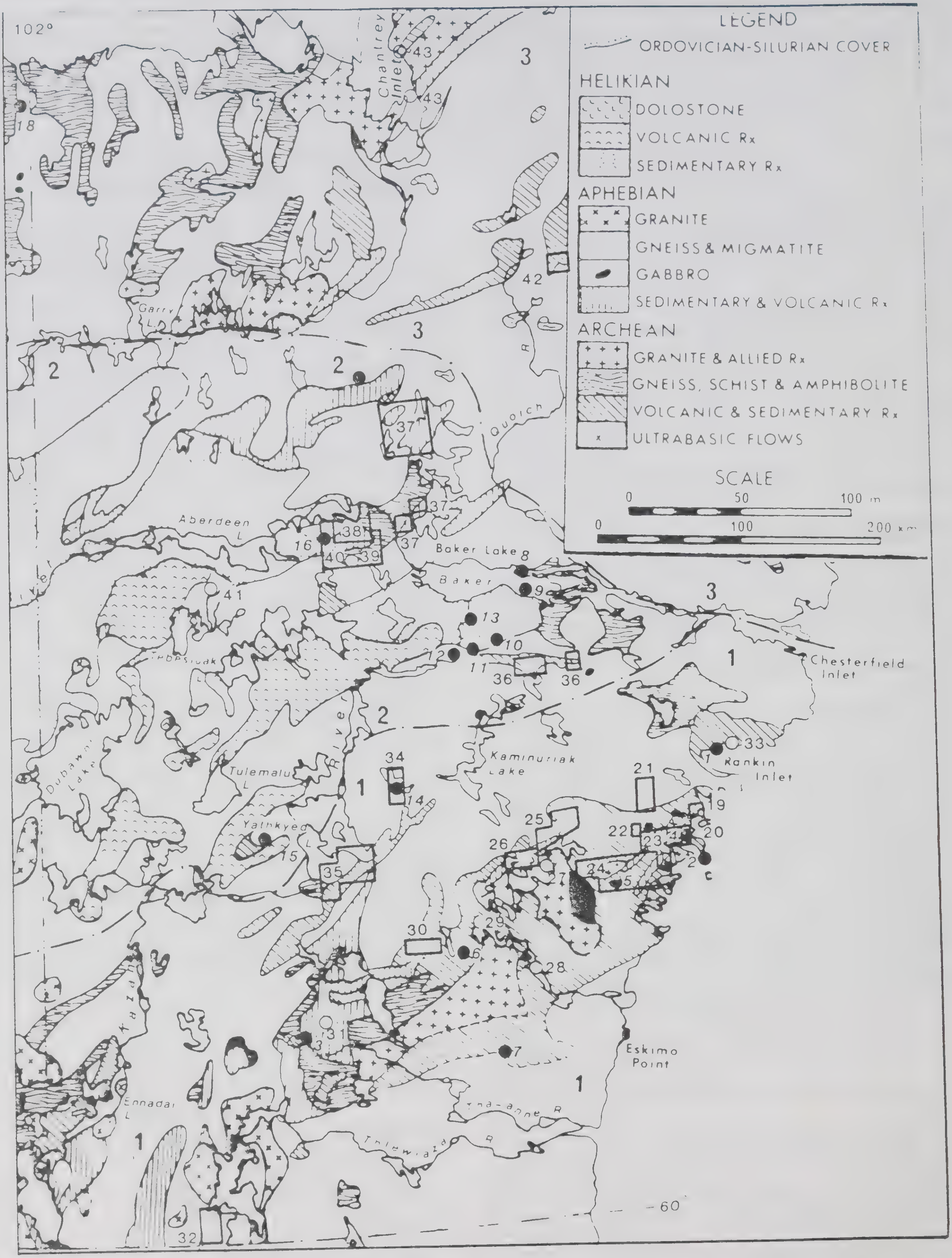


FIGURE 5-1: Geology map of the Keewatin Region showing subdivisions: 1) Ennadai Lake-Rankin Inlet area 2) Baker Lake-Thelon River area 3) Chantry Inlet-Wager Bay area; mineral deposits and 1986-87 exploration projects.

TABLE 5-1: MINERAL DEPOSITS OF THE KEEWATIN REGION (summarized from Cain and Brown, 1986)

	DEPOSIT ●	GRADE	TONNAGE (tonnes)	COMMENTS
1	RANKIN NICKEL	Cu 0.93%, Ni 3.20%, Pt 3.77% plus Cu 0.93%, Ni 1.25%	405 972 58 514(indicated)	Past producer, 1957-62. Platinum grade given was reported in 1929. No figure for platinum is available from 1957 reserve estimates stated at left, prior to the commencement of mining. Produced 2631 t Cu and 9662 t Ni from 368 099 t of ore. National Mineral Inventory.
2	TERM POINT	Au n.a.*	unknown	Past producer, 1918, 1928, 1987. Total production is 9.1 kg Au. 1987 production was 2.7 kg Au from 0.5 t. "Mine Finders" by B.F. Townsley, Saturday Night Press, Toronto (1935) and George Cross News Letter, Oct. 22, 1987.
3	CULLATON LAKE GOLD MINES		1 031 284	Past producer, 1981-85. Cullaton Lake (B Zone) produced 2395.9 kg Au at 16.8 g/t and 439.68 kg Ag from 225 727 t of ore. Shear Lake produced 830.2 kg Au at 7.2 g/t and 61.33 kg Ag from 168 997 t. Company reports and DIAND assessment reports. Reserves from Canadian Mines Handbook, 1985-86.
4	MAR	Cu 0.81%, Ni 0.08%	0.064 million	National Mineral Inventory.
5	FAT LAKE	Au 10 g/t	50 000	Tonnage from assessment report of Borealis' exploration program. DIAND assessment report 062274.
6	HENINGA LAKE	Zn 9.0%, Cu 1.3% Ag 68.6 g/t, Au 1 g/t	5.44 million	National Mineral Inventory.
7	ICE	Fe 20-40%	400 million	Tonnage from GSC OF 716 (p. 29), 1981.
8	BAKER LAKE - NORTH SHORE	U_3O_8 0.5-1.08% Mo n.a.*	unknown	Up to 453.6 t of U_3O_8 and 907 t of MoS_2. National Mineral Inventory.
9	CHRISTOPHER ISLAND	U_3O_8 0.04% Mo n.a.*		Greater than 72 t of U_3O_8 and 68 t of MoS_2. National Mineral Inventory.
10	BISSETT CREEK	U_3O_8 0.05-0.62%	unknown	Mineralized zone intersected down to 150 m depth. National Mineral Inventory.
11	KAZAN RIVER	U_3O_8 0.01-0.22% Cu 0.3-1.45%	unknown	Mineralized zone 183 m by 61 m and 36 m deep. National Mineral Inventory.
12	KAZAN RIVER	U_3O_8 0.05-0.81% Cu 0.3-1.45%	unknown	Mineralized zone to 350 m depth. National Mineral Inventory.
13	KAZAN FALLS	U_3O_8 0.46%	unknown	455 t of U_3O_8 in fracture system 1.8 m wide and 90 m deep (Northern Miner, August, 1974). National Mineral Inventory.
14	FERGUSON LAKE	Cu 0.9%, Ni 0.8%	7.3 million	Personal communication, P.J. Laporte, DIAND, Yellowknife.
15	LAC CINQUANTE	U_3O_8 1.10%	0.48 million	Estimated resource of 5289 t of U_3O_8 in drill indicated and inferred tonnage. Abermin application for listing, Vancouver Stock Exchange, January 16, 1986.
16	KIGGAVIK	U_3O_8 0.6% Pb trace-50%	3.63 million	Contains 18 144 t of U_3O_8. Northern Miner, Nov. 8, 1984 and Sept. 23, 1987.
17	AMER LAKE	U_3O_8 n.a.* Mo n.a.*	unknown	National Mineral Inventory.
18	PERRY RIVER	Cu 0.5%, Ni 1.25%	unknown	"L showing" boulder train showing, some Cu-Ni minerals *in situ* but of lower grade. National Mineral Inventory.

n.a.* not available

1986-87 Exploration Projects

19. ANT CLAIMS
20. WHALE COVE PROPERTY
21. PROSPECTING PERMITS 1084, 1085
22. BANNOCK LAKE SHOWING
23. IGLOO PROJECT
24. KEEWATIN GOLD PROJECT & FAT LAKE DEPOSIT
25. HAPPY LAKE PROJECT
26. PROSPECTING PERMITS 1082, 1083
27. PETER CLAIMS
28. ERIC AND MAGUSE LAKE PROSPECTS
29. TURQUETIL LAKE PROJECT
30. PROSPECTING PERMITS 1106, 1107
31. SUNDOG PROJECT
32. SANDYBEACH PROPERTY
33. MELIADINE RIVER PROJECT
34. FERGUSON LAKE PROPERTY
35. SY PROJECT
36. PARKER LAKE PROJECT
37. BAKER LAKE PROJECT
38. SCHULTZ LAKE PROJECT
39. SAM CLAIMS
40. SISSONS-SCHULTZ PROJECT
41. MARJ CLAIMS
42. PROSPECTING PERMIT 1090
43. QUILIK, M CLAIMS

○ Project areas

LOCATION

ANT 1-4 and SON 1 are on the north shoreline of Pistol Bay, approximately 48 km southwest of Rankin Inlet. ANT 5 is on Morso Island, 16 km south of the Hamlet of Whale Cove (Fig. 5-2).

HISTORY

From 1961 to 1962, Tavane Exploration (North Rankin Nickel Mines) carried out prospecting, trenching and reconnaissance, along with packsack drilling and EM surveys in the Pistol Bay area. Arsenopyrite in volcanics, diorite intrusions, quartz veins and gossans were found. Assays of up to 41 ppm Au were reported from a sample of a vein in the Pistol Bay area with an exposed strike length of 110 m and widths up to 1.3 m. A quartz vein sample from Morso Island yielded 2 ppm Au.

In 1969 and 1970, Marouba Holdings Ltd. trenched and mapped in the Pistol Bay and Morso Island areas. The best assays for samples from the two areas were 45 ppm Au, 55 ppm Ag, 0.07% Cu and 0.09% Ni and 26 ppm Au, 29 ppm Ag, 0.89% Cu and 0.08% Ni, respectively. In 1970, Husky Oil held claims and permits in the area and established a small grid for an EM survey.

Five Star Petroleum and Mines Ltd. acquired the MAR claims in 1970 and 1971. Kenting Earth Sciences Division was contracted to do an EM survey of the Pistol Bay area; Five Star completed a corresponding magnetometer survey. A total of 265 m in six diamond-drill holes tested geophysical targets, but no economic mineral concentrations were intersected.

In May 1972, J. Antoshkiw excavated two trenches on Morso Island and completed 59 m of diamond drilling in two holes. No assays were reported, but visible gold in drill core was noted in the logs.

A number of companies, including Aberdeen Minerals and Silver Chief Minerals, examined showings in the area between 1972 and 1981. In 1976, Sik Sik Golden Copper Mines Ltd. drilled one hole totalling 22.8 m. No assays were reported, but arsenopyrite and visible gold were noted in a quartzite intersection.

ANT 1-5 and SON 1 were staked by J. Antoshkiw in 1985.

DESCRIPTION

Kaminak Group basalt and andesite flows, in part pillowed, with associated tuff and agglomerate, minor breccia, related synvolcanic intrusions and derived schists and gneisses, underlie the Pistol Bay claim group. A basal sequence of siltstone and argillite hosts carbonate-, oxide- and sulphide-facies iron formation. The volcanics are intruded in the northeast and west by quartz diorite plutons. Aphebian orthoquartzites of the Kinga Formation overlie the volcanics and granodiorite (Fig. 5-2).

ANT 5, on Morso Island, covers massive Kaminak Group basalts and synvolcanic intrusions of gabbro and anorthositic gabbro. The complex is intruded by granodiorite dykes related to an offshore granodiorite intrusion.

CURRENT WORK AND RESULTS

J.W. Campbell (DIAND assessment report 082486) examined the property for Borealis in 1986 and the claims were transferred to Borealis Exploration Ltd. in January 1987.

In 1987, fracture controlled sulphide-bearing quartz veins on ANT 5 on Morso Island were geologically mapped and sampled. One quartz vein, traced discontinuously for 1270 m, pinches and swells to a maximum width of 2 m. Locally the vein contains pyrite, chalcopyrite and arsenopyrite. Samples taken from quartz veins and shear zones on the island assayed trace to 1 ppm Au and trace to 5.6 ppm Ag.

In 1987, ANT 1-4 and SON 1 at Pistol Bay were geologically mapped and rocks were sampled. Main targets were zones of hydrothermal alteration, gossans and iron formations. A 1 to 4 m wide quartz-carbonate vein was traced for a strike length of 300 m. Of the 19 samples taken from the vein and wallrock, 15 assayed in excess of 100 ppb Au. A 1 m sample of sulphide-enriched wallrock assayed 22 ppm Au and 1.4 ppm Ag.

WHALE COVE PROPERTY

Borealis Exploration Ltd.	Gold, Silver,
960, 540 5th Ave. SW	Copper, Nickel
Calgary Alta., T2P 0M2	55 K/1,2
	62°22'-62°14'N
	92°26'-92°38'W

REFERENCES

Heywood (1973); Laporte (1974a, 1976); Wright (1967).
DIAND assessment report: 082691.

PROPERTY

BSX 5-6 (F10090-F10091).
BSX 7-10 (F14660-F14663).

LOCATION

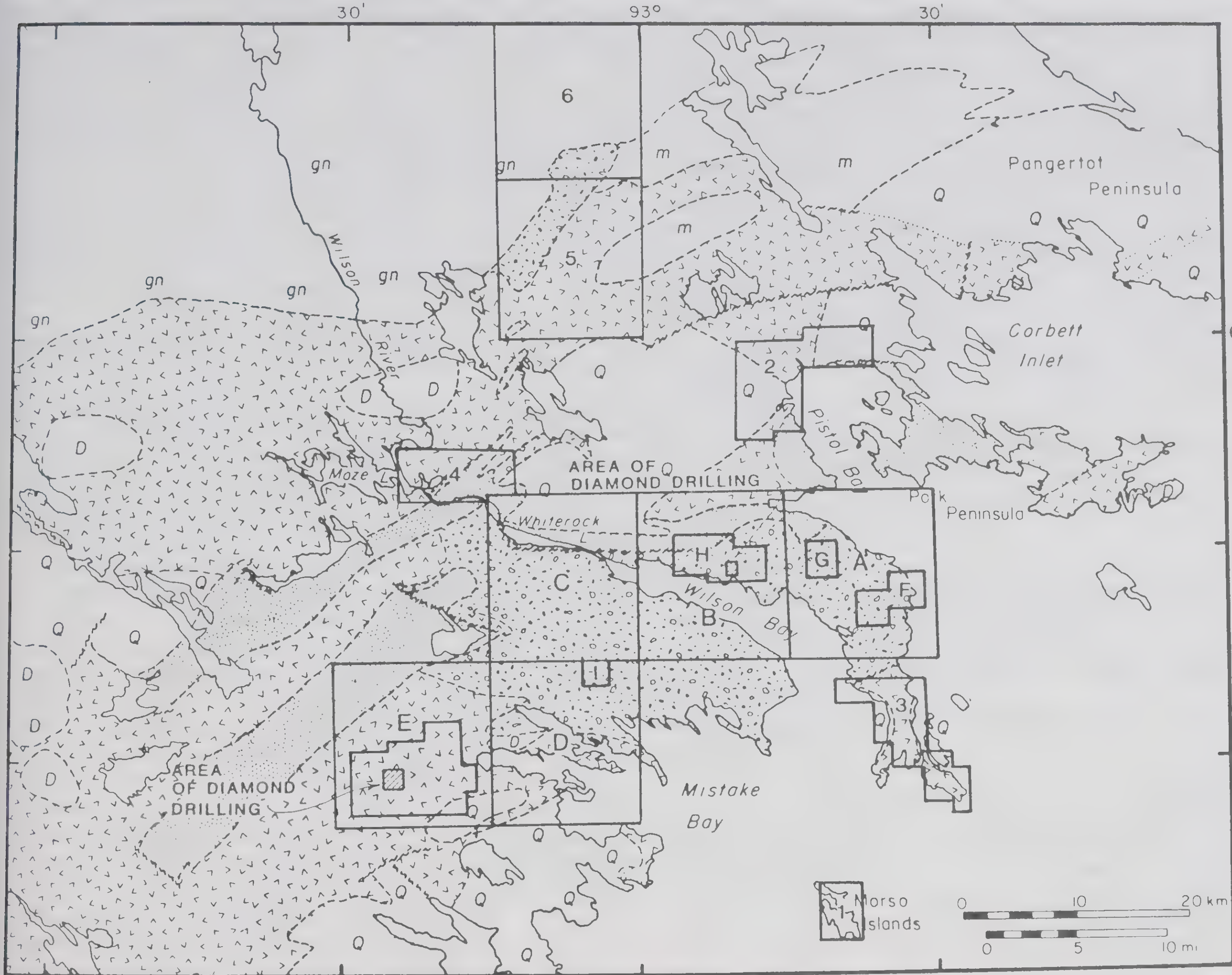
The property is 75 km south of Rankin Inlet. The Hamlet of Whale Cove is at the periphery of the claims, which cover a 20 km long peninsula extending into Hudson Bay (Fig. 5-2).

HISTORY

In 1928, a 500 kg bulk sample of quartz-carbonate material was taken from the "Term Point" Occurrence on the peninsula. The sample purportedly yielded 5.38 kg of gold.

The first recorded work on the peninsula was in 1961 when the Tavane Syndicate, a subsidiary of Rankin Nickel Mines, examined the area and delineated gossans in shears, tuffs, pillow selvedges, joints and cracks. Massive pyrite, chalcopyrite, marcasite and pyrrhotite as well as minor malachite, azurite and bornite were observed. Veinlets of massive molybdenite are associated with irregular, sucrosic aplite dykes. On the CAT claims in the Copper Cove area, massive chalcopyrite in an amphibolite-hosted gossan, 2.5 m by 12.0 m in area, was channel sampled. Channel samples assayed up to 24.38% Cu and 0.4% Ni. An EM survey of the area defined anomalies that were tested by three diamond-drill holes totalling 174 m. Channel samples from the JAN claims near Jawbone Cove, about 2 km east-northeast of Whale Cove, assayed up to 177 ppm Au, 84 ppm Ag and 2.70% Cu.

In 1969 the MAR claim group was staked by J. Gorski for Maroubra Holdings Ltd. The claims covered ground immediately north of Whale Cove. Three diamond-drill holes totalling 23 m were completed and trenches were excavated on the Copper Cove showing. Reported assays were up to 5.45% Mo, 6.70% Cu and 0.22% Ni. Samples taken from an area corresponding to the CAT claims assayed 4.5% to 6.7% Cu and 0.09 % to 0.22% Ni. The claims lapsed between late 1972 and early 1973.



LEGEND

APHEBIAN

HURWITZ GROUP:

Orthoquartzite, slate and mudstone, mafic volcanic flows, quartzose and feldspathic sandstone

APHEBIAN and/or ARCHEAN

m Gneiss and migmatite

gn Layered gneiss and quartz-biotite schist

D Diorite, gabbro

ARCHEAN

Q Quartz diorite, granodiorite and quartz monzonite

KAMINAK GROUP

Slate, argillite, impure sandstone, greywacke, iron-formation, conglomerate

Mafic to felsic volcanic rocks

PROPERTIES

Canadian Nickel Company Ltd.

A. P.P. 1020
B. P.P. 1021
C. P.P. 1073
D. P.P. 1018
E. P.P. 1019
F. IGLOO 12-13
G. IGLOO 11
H. IGLOO 1-3
I. IGLOO 14
J. IGLOO 4-10

Borealis Exploration Company Ltd.

1. ANT 5
2. ANT 1-4, SON 1
3. WHALE COVE PROPERTY
4. BANNOCK PROJECT
5. P.P 1084
6. P.P. 1085

FIGURE 5-2: Geology and properties explored during 1986 and 1987, Wilson Bay area (geology after Heywood, 1973).

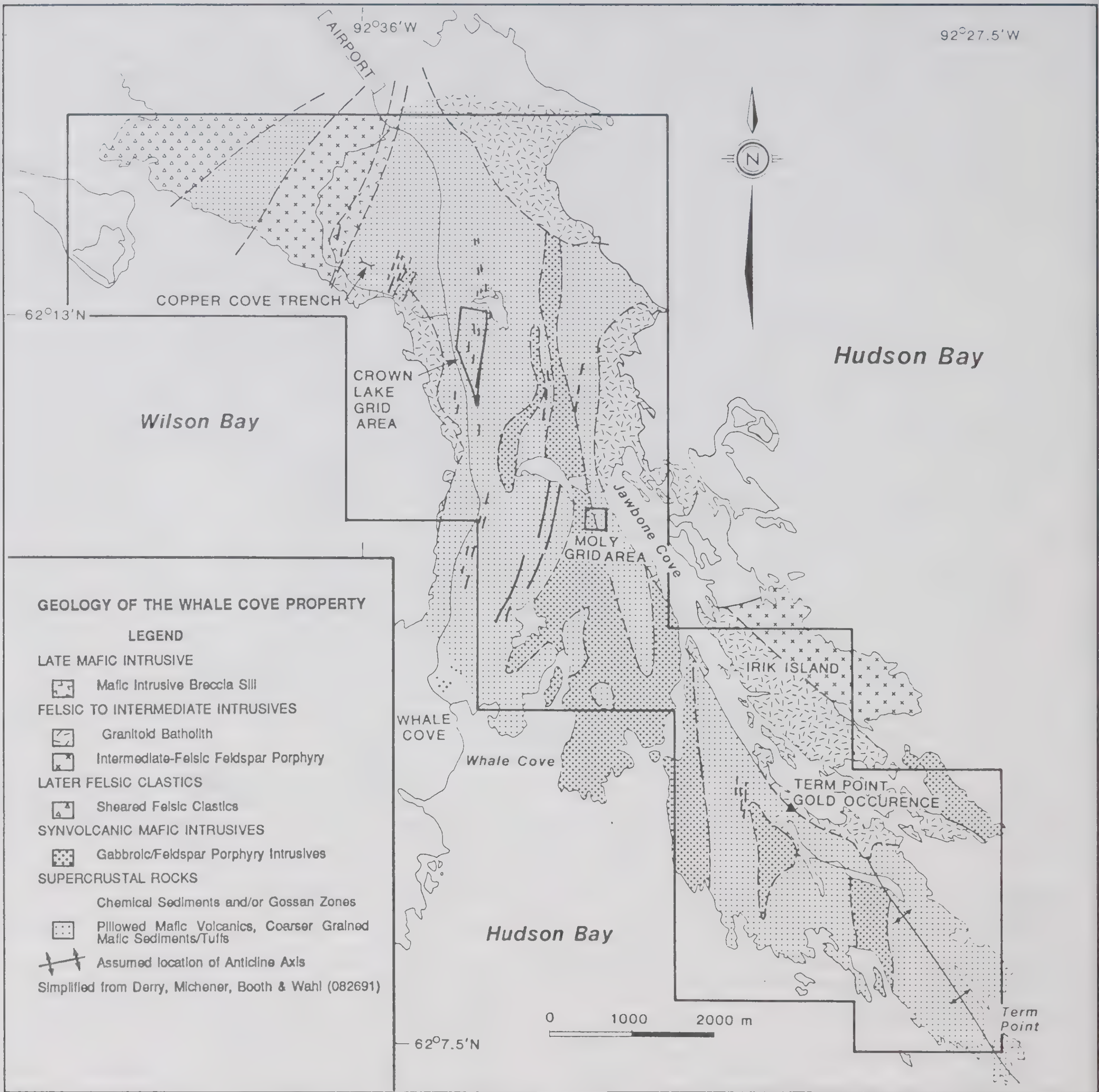


FIGURE 5-3: Geology and boundaries of the BSX claims, Whale Cove area.

The ground was restaked in 1972 and 1973 as the HI and MINE claims and ownership was transferred to Mont-Alta Projects Ltd. Four diamond-drill holes totalling 200 m and nine trenches tested showings on the property.

In 1977, W.D. Groves examined the Jawbone Cove area for E.A. Tipman. A number of old showings and molybdenum-bearing quartz veins were evaluated. Tipman staked MB 1 and ANITA 1 to cover the molybdenum showing.

DESCRIPTION

The peninsula is underlain by basalts, andesites and associated interflow sediments of the Kaminak Group. Mafic volcanics are massive to pillowed and in places exhibit variolitic, amygdular and porphyritic textures. Interflow chemical sediments with associated sulphide- or silicate-facies iron formation and epiclastic rocks are found within the volcanic assemblage which is intruded by fine- to medium-grained, locally porphyritic, mafic dykes and sills, and feldspar porphyry dykes. Volcanics comprise 60% of outcrop area. Late mafic intrusions include fine-grained mafic dykes, subordinate lamprophyre dykes and an intrusive breccia. The breccia, 1.5 km in strike length, contains fragments of sulphide-facies iron formation (Fig. 5-3). Felsic sediments or pyroclastics overlay the succession and outcrop in the northwest of the

claim group. Supracrustal rocks are intruded on the east and west shorelines of the peninsula by quartz diorite, granodiorite and quartz monzonite.

The assemblage is north striking and steeply dipping. Facing directions, determined by pillow tops, suggest the rocks are gently folded into an anticline although the position of the anticlinal axis has not been found. Fracturing and shearing is observed locally. Two sulphide-bearing fracture sets have been identified on the property. North-trending shears commonly contain quartz carbonate veins and stringers, with local concentrations of chalcopyrite, pyrite and gold.

CURRENT WORK AND RESULTS

In the spring of 1987, BSX 5-10 were recorded by Borealis Exploration Company. During July and August in 1987, regional prospecting, sampling and local detailed mapping concentrated on iron formations, carbonate shears and chalcopyrite- and molybdenite-bearing quartz veins. Reconnaissance geological mapping covered the entire claim group. Gridding, detailed geological mapping and sampling targeted the Molly Prospect at Jawbone Cove and the area southwest of Crown Lake.

Molybdenite in the Jawbone Cove area is commonly confined to the selvedges of smoky quartz veins striking 047° and dipping 55° northwest. Chalcopyrite is concentrated in fractures in the centre of the quartz veins. Eight of 38 grab and chip samples taken from the prospect assayed greater than 100 ppb Au. Assays as high as 1.4 ppm Au, 13.7 ppm Ag, 1.2% Cu and 120 ppm Mo were reported.

Two major iron formations are enclosed by basalts on the Crown Lake grid. The "East zone" is a "pinch and swell" structure up to 8 m wide, consisting of grey chert with pyrite, pyrrhotite and chalcopyrite. The iron formation contains recrystallized white sucrosic quartz lenses with pyrite. Two showings of native copper are in the zone.

The "West zone" is a "dry", sulphide-poor, silicate-oxide-facies iron formation. A sample taken from quartz-carbonate veins within the sheared, carbonate altered hanging wall of the "West zone" iron formation, assayed 7.6 ppm Au and 229 ppm Ag.

Two showings were re-examined during the summer. The Copper Cove trench was sampled. Assays from the samples ranged from 10 to 2400 ppb Au; 1.1 to 62.1 ppm Ag; 940 to 14 100 ppm Cu and 97 to 1825 ppm Ni. Four samples were taken near the trench at the Term Point Occurrence; all samples contained less than 10 ppb Au.

Three showings were discovered during regional mapping. A unit of iron formation was found in the Water Lake area. The iron formation is 8 to 17 m wide and exposed along strike for 160 m. Facies changes are prevalent and the unit contains sulphide-, sulphide-silicate and local oxide-facies interbedded with volcaniclastic sediments. A second showing, gossanous pillow basalts, was also found in the Water Lake area. Two gossan lenses, approximately 25 m long and up to 5 m wide, are cross-cut by two narrow shear zones. The third zone is an auriferous quartz-carbonate vein, found near the Hamlet of Whale Cove. The vein is 10 to 40 cm in width and exposed for about 25 m. Locally, it contains concentrations of chalcopyrite and minor sulphides. A composite grab sample, taken along strike, assayed 8.0 ppm Au.

PROSPECTING PERMITS 1084, 1085

Borealis Exploration Ltd.	Gold
960, 540 5th Ave. SW	55 K/11
Calgary, Alta., T2P 0M2	62°30'-62°45'N
	93°00'-93°15'W

REFERENCES

Heywood (1973); Laporte (1987).
DIAND assessment report: 082141.

PROPERTY

Prospecting Permits 1084, 1085.

LOCATION

The permit areas are about 42 km north-northwest of the Hamlet of Whale Cove.

HISTORY

There is no work recorded for the permit areas. An airborne magnetic map was produced by the GSC in 1964. From 1966 to 1967 the area was mapped by Heywood (1973).

Borealis Exploration Ltd. acquired Prospecting Permits 1084 and 1085 in 1986 to cover magnetic anomalies defined by the GSC airborne survey.

DESCRIPTION

The permits cover Archean felsic and mafic lavas, pyroclastics, sediments and sedimentary exhalites, in contact with a belt of layered gneiss and quartz biotite schist. Oxide-facies iron formation are metasediment-hosted beds of massive magnetite, forming banded units 20 cm to 15 m wide. Metamorphic grade is upper greenschist to amphibolite. Extensive drift covers much of the permit areas (Fig. 5-2).

CURRENT WORK AND RESULTS

In 1986, magnetic anomalies identified by the GSC airborne magnetic survey were mapped and sampled. Anomalies were correlated to massive magnetite bands. Nineteen litho-geochemical samples and one pan concentrate sample were taken but failed to yield significant assays. No further work was recommended for the permits.

BANNOCK LAKE SHOWING

Borealis Exploration Ltd.	Gold
960, 540 5th Ave. SW	55 K/6
Calgary, Alta., T2P 0M2	62°08'-62°24'30"N
	93°15'30"-93°23'W

REFERENCES

Laporte (1976, 1985b).
DIAND assessment report: 082694.

PROPERTY

BSX 1-2 (F14725-F14726).
BSX 3 (F14723).
Borealis Exploration Ltd. acquired BSX 1-4 in late 1986. No work was done on BSX 4.

LOCATION

The claims are 5 km east of Maze Lake and 7 km northwest of Whiterock Lake, approximately 78 km southwest of Rankin Inlet (Fig. 5-2).

HISTORY

The earliest known work in the area was during the 1930s, when quartz veins were prospected. The ground was staked in 1938 by E. Connolly, but no record was found of work on the claims. The first recorded work was performed on Prospecting Permit 17 in 1961 by the Tavane Syndicate, a subsidiary of Rankin Nickel Mines Ltd. At that time, gold was discovered by R. Maloney and P. McLeod in the Bannock Lake area.

In 1970 Husky Oil Ltd. acquired Prospecting Permit 202 covering the Bannock Lake area and flew EM, magnetic and radiometric surveys, followed by prospecting, trenching and ground geophysical and geological surveys. One sample was collected from the Bannock Lake showing, but did not contain gold. The permit expired in April 1973.

In 1973, stakers guided by P. McLeod staked the DEB and EVE claims for D. Hurd. The claims covered the southeastern part of the Bannock Lake showing. Ten trenches were blasted and sampled.

The area was restaked in 1981 as the JA and SC claims. Quartz veins at the showing were sampled and the highest assay obtained was 4.1 ppm Au and 2.0 ppm Ag. The JA claims lapsed in 1983 and the SC claims in 1986.

DESCRIPTION

> The claims cover the northeastern end of a synclinorium of Hurwitz Group Kinga Formation orthoquartzite and the overlying Ameto Formation slate, mudstone and volcanics. These rocks are underlain to the northwest and northeast by Archean mafic volcanics of the Kaminak Group. Metasediments of the Kaminak Group outcrop at the contact between the Archean volcanics and Aphebian orthoquartzite south of Bannock Lake and at the contact between the volcanics and intrusive Archean quartz diorite to granodiorite to the east.
>
> The Kaminak Group metasediments south of Bannock Lake are impure quartzite and grit which grade into conglomerate containing well-rounded granitic boulders up to 76 cm in diameter. The northeast-trending sediments are cut by north-northwest-trending faults, and to the east, are in fault contact with basaltic flows and diorite.
>
> Two gold-bearing zones were outlined [by Maloney and McLeod] in 1961. In Zone 1, a discontinuous quartz vein up to 1.5-m-thick dips 60°E in a poorly developed shear zone in conglomerate. Zone 2, 800 m to the southeast, is a rusty-weathering shear zone trending 60°E in conglomerate, basalt and diorite. A 1.5-m-wide quartz vein dipping 80°E in the shear zone contains gold and, locally, concentrations of sulphides. Samples from the Bannock Lake Showing collected in 1961 contained 132 and 6.5 ppm Au. Grab samples collected from trenches by D. Hurd in 1973 contained tr. to 57 ppm Au. Visible gold was removed from 6 of the 20 samples collected in 1973 before assaying. (Laporte, 1985, p. 161)

CURRENT WORK AND RESULTS

In July and August of 1987, lithogeochemical and pan concentrate samples were collected from the two gold showings and a major northeast-striking shear zone was mapped, prospected and sampled. One showing is 250 m south of Bannock Lake. Sheared boulder conglomerate hosts a quartz vein 0.3 to 1.5 m wide, which is exposed in trenches for a strike length of 200 m. The quartz vein contains up to 10% disseminated and massive pyrite and chalcopyrite and is hematized and carbonatized. The highest lithogeochemical sample assay was 2.7 ppm Au.

The other showing, 1.5 km northeast of the first showing, a quartz vein exposed in two trenches, is developed at the faulted contact of sheared gossanous boulder conglomerate and mafic to intermediate volcanics. Samples of the quartz vein assayed less than 50 ppb Au.

The shear zone was traced for 2.5 km and is a series of en-echelon shears with lenses of less deformed rock. It is locally silicified, carbonatized and sulphide bearing. The highest assay from the shear zone was 0.5 ppm Au.

IGLOO PROJECT

Canadian Nickel Co.	Gold
Copper Cliff, Ont., P0M 1N0	55 K/3,6,7
	62°15'N, 93°00'W

REFERENCES

Laporte (1987).
DIAND assessment reports: 082133, 082179.

PROPERTY

Prospecting Permits 1018, 1019 (55 K/3 N).
Prospecting Permits 1020, 1021 (55 K/7 S).
Prospecting Permit 1073 (55 K/6 SE).
IGLOO 1-14 (F12402-F12415).

LOCATION

The area is centred on a point 100 km southwest and 50 km west of the hamlets of Rankin Inlet and Whale Cove respectively. The permits and claims cover an area bordering on Wilson Bay and Mistake Bay, on the shore of Hudson Bay (Fig. 5-2).

HISTORY

The first recorded exploration work in the area was by Giant Yellowknife Mines Ltd., who held area 55 K/3 as Prospecting Permit 3 from 1961 to 1964 and North Rankin Nickel Mines Ltd., who held areas 55 K/6 and 7 as Prospecting Permits 17 and 18 from 1961 to 1962. Subsequent exploration outlined a number of uneconomic gold and copper showings. Giant Yellowknife Mines Ltd. staked and leased PEN 1-21 and STEIN 1-8, which cover iron deposits northwest of Mistake Bay (within the area covered by Prospecting Permit 1018) and the TORIN claims covering copper-nickel and copper-gold showings on the Ferguson River (just south of Prospecting Permit 1019).

Husky Oil Ltd. acquired Prospecting Permit 202 in 1970 to cover 55 K/6 (Laporte, 1987). Radiometric, electromagnetic and magnetic surveys flown in 1970 were followed up by ground geophysical and geological investigations in 1970 and 1972. No economic concentrations of metals were detected and the permit expired in 1973.

Samples containing anomalous gold were collected from various lithologies during 1981-83 regional reconnaissance

sampling by Inco personnel. Most samples were collected from exhalative sulphides and iron formations. Inco applied for Prospecting Permits 1018 and 1021 in 1984 to cover anomalous gold concentrations detected during reconnaissance. Magnetic and EM surveys as well as reconnaissance geological mapping and prospecting were completed in 1984 and 1985. Approximately 33% of the samples taken contained anomalous gold. In the summer of 1985 a till sampling survey outlined a number of anomalies and Prospecting Permit 1073 was acquired.

DESCRIPTION

The permits cover Archean sedimentary and volcanic rocks of the Kaminak Group, unconformably overlain by sedimentary rocks of the Aphebian Hurwitz Group.

Much of the southern portion of Prospecting Permits 1020, 1021 and 1073 and the northern portion of Prospecting Permit 1018 is underlain by Kaminak Group sediments. Argillite, impure sandstone and greywacke outcrop on the north shore of Mistake Bay and on both shores of Wilson Bay. Within much of the sequence, bedding is thin and indistinct. Conglomerate is found locally. Granitic clasts form 75% of the rock and volcanic clasts the remainder.

The sediments enclose widely distributed arcuate layers of Algoman-type magnetite iron formation up to 60 m thick. Alternating layers of magnetite and quartz from 0.3 to 30 cm in thickness are interbedded with chert, jasper, or slate beds up to 1.3 m thick, forming thin, laterally extensive layers. Sulphide and carbonate facies layers are rare.

In the southwest portion of Prospecting Permit 1018 and in 1019 the sediments are underlain by basalts and andesites. Primary textures such as pillows, amygdules and feldspar phenocrysts are preserved locally in the mafic volcanics. Dacites, rhyolite, quartz porphyry, quartz-feldspar porphyries and felsic pyroclastics (predominantly ash flows) are found within the volcanic assemblage.

Orthoquartzites, impure quartzites, greywacke, conglomerate and dolomite of the Aphebian Hurwitz Group are exposed in the northwest corner of Prospecting Permit 1019, in a synclinal northeast-trending trough and in Prospecting Permits 1073 and 1021 as discontinuous east-trending outliers.

The sediments and volcanics form a northeasterly facing homoclinal sequence intruded in the north and the west by quartz diorite, granodiorite and quartz monzonite plutons. Synvolcanic intrusions including peridotite, gabbro and diorite sills and plugs and quartz-feldspar porphyry dykes cut the permit areas. Two diorite-gabbro plugs host auriferous shears. Iron carbonate alteration, silicification, fuchsite and arsenopyrite are found predominantly within the volcanic rocks. Iron carbonate is found both as veins and disseminations within various lithologies. Disseminated or vein arsenopyrite is found throughout the permits and is associated with elevated gold. Silicification is rare and usually associated with gold. Fuchsite is also rare.

CURRENT WORK AND RESULTS

In 1986, IGLOO 1-14 were staked. IGLOO 1-3 were staked to cover IP anomalies in the area of the Wilson Bay plug. IGLOO 4-10 and 11-13 were staked within Prospecting Permits 1019 and 1020 respectively.

Exploration in the summer of 1986 included reconnaissance and detailed mapping, gridding and detailed geophysical surveys. During reconnaissance mapping, an arsenopyrite-bearing felsic dyke, 15 m wide with a strike length of more than 200 m, was discovered. IGLOO 14 was staked to cover the dyke.

Targets for grid controlled detailed mapping were shear and alteration zones within two diorite-gabbro plugs and a folded iron formation. The diorite-gabbro plugs are on the north shore of Big Lake and the north shore of Wilson Bay (Fig. 5-2). Shear zones within the plugs are characterized by quartz and iron carbonate flooding and up to 10% pyrite and arsenopyrite. Alteration zones reach 10 m in thickness and several tens of metres in length. A fuchsite-bearing sample from one shear zone assayed 25.5 ppm Au.

The Whiterock iron formation is approximately 1 km north of the Wilson River, between Whiterock Lake and Wilson Bay. Banded oxide-facies iron formation within greywackes defines a fold opening to the east. Pyrite is in both the iron formation and the enclosing sediments, and samples taken from pyritic sections assayed up to 4.2 ppm Au.

Magnetometer and EM surveys were performed over the iron formation and the Big Lake plug, a VLF survey was performed over the Big Lake plug and IP surveys were conducted over both plugs. The surveys detected a number of anomalies and conductors.

In 1987, 263 m of diamond drilling was completed in 18 holes. Two phases of drilling at the Wilson Bay plug consisted of 124 m in five holes and three follow-up holes. The first target was a hematized, silicified zone over an area 100 by 150 m at the northeast margin of the plug where up to 10% arsenopyrite and pyrite were observed locally. Six holes were collared in the gabbro to test the zone along a strike length of 300 m. Drill results suggest that the gabbro contact dips approximately 60° to the south. Quartz diorite and sediments were intersected beyond the gabbro contact. All rock types have been sheared and brecciated and all, in places, host gold. A zone 5.1 to 6.45 m in width, with a minimum strike length of 100 m, was intersected in three holes and samples assayed 6.62 ppm over 5.16 m, 4.84 ppm over 6.45 m and 1.96 ppm over 5.10 m.

An IP response immediately south of the first target area was drilled. An intersection of quartz diorite with arsenopyrite provided an assay of 2.65 ppm Au over 6.6 m. The final drill target, an assumed north-trending fault zone on the west side of the main zone, yielded an intersection of 7.87 ppm Au over 1.5 m.

At Big Lake, 10 holes totalling 1386.24 m were drilled. Six holes were designed to test a northeasterly trending shear zone, 1 to 3 m in width and 500 m long. Auriferous zones were less than 1.5 m in apparent width and intersections assayed 2.23 ppm to 15.7 ppm Au. Four other holes tested separate targets in the area. Three targets, an auriferous chert bed, an EM conductor and an altered shear zone, did not provide significant intersections. A 1.5 m intersection from an IP target assayed up to 12.4 ppm Au.

During 1987, geological mapping and channel sampling was carried out on IGLOO 1, 2, 9 and 10. Visible gold was found at four separate areas on IGLOO 9 and 10 (the Big Lake plug) and channel samples assayed as high as 52.7 ppm Au over a 1.2 m interval.

Geological surveys were carried out over the southwestern portion of Prospecting Permit 1073 and previously unmapped areas of the Whiterock Iron Formation. A magnetometer survey completed coverage of the Whiterock grid.

Sampling was carried out on IGLOO 6 and 13. Samples collected along a granodiorite/basalt contact provided two assays greater than 1 ppm Au, a gossan sample yielded 8.18 ppm Au and a gossan within a shear zone yielded 7.32 ppm Au.

KEEWATIN GOLD PROJECT AND FAT LAKE DEPOSIT

Borealis Exploration Ltd.
960, 540 5th Ave. SW
Calgary, Alta., T2P 0M2

Gold
55 K/3,4, L/1
62°00'-62°15'N
93°15'-94°30'W

REFERENCES

Cadiz (1989); Davidson (1970); Heywood (1973); Laporte (1987); Padgham (1985).

DIAND assessment reports: 082138, 082140, 082676, 082788, 082809, 082824.

Mineral Inventory File 55 K/4, Au 3.

PROPERTY

SUSAN, SUSAN 2-3 (F12136-F12138).

Prospecting Permits 1070, 1079, 1080, 1081, 1100, 1101, 1102.

AIRSTRIP 1 (F11733).

LOCATION

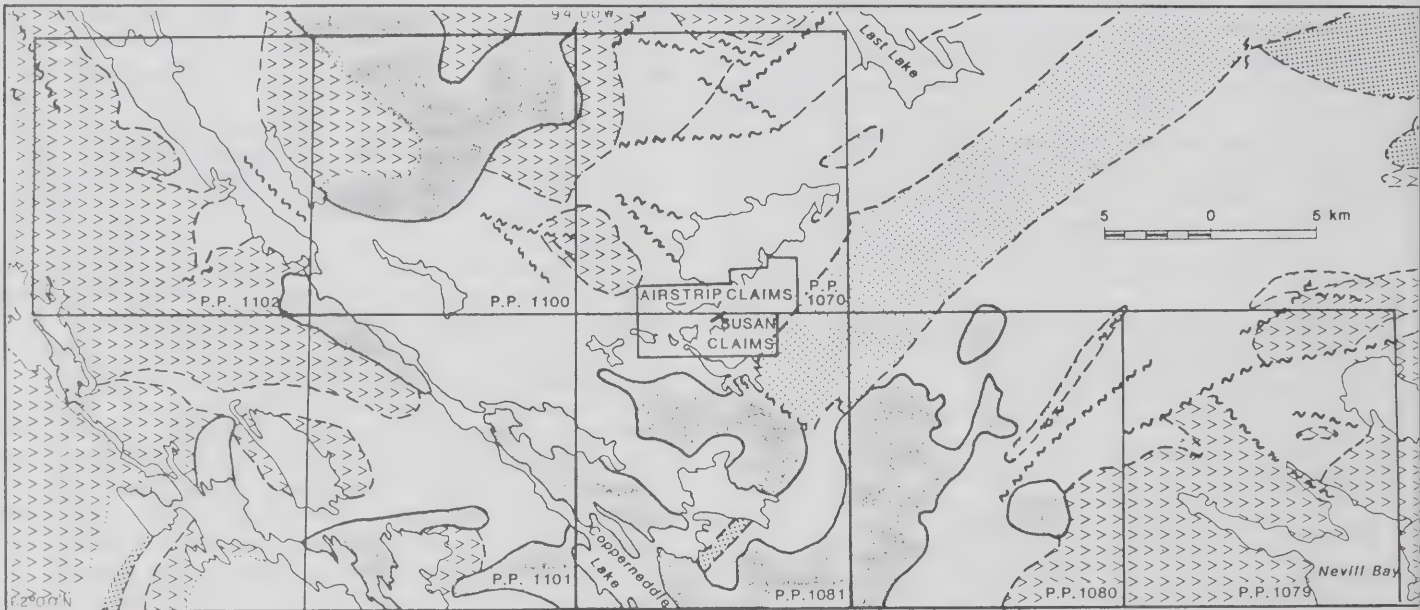
The permit areas extend from Nevill Bay, approximately 42 km west-southwest of the Hamlet of Whale Cove, to Southern Lake, 4 km southeast of Quartzite Lake (Fig. 5-4). The SUSAN and AIRSTRIP claims are between Prospecting Permits 1070 and 1081.

HISTORY

The Last Lake area was first examined by Hudson Bay Mining and Smelting Company Ltd. during the late 1940s. A gold showing in the north portion of Prospecting Permit 1081 was trenched, but the results were not reported. In the late 1950s Newmont Mining Corporation of Canada staked the GUN claims over a copper showing west of Last Lake. Tavane Syndicate flew a magnetometer/EM survey over the southern permit areas in 1959.

Giant Yellowknife Mines flew a regional magnetometer/EM survey, covering the area of the current permits, in 1960. Ground follow up included the examination of the copper showing on the GUN claims and a gold showing in the north portion of Prospecting Permit 1081. Three conductors were trenched and subsequently drilled (TORIN Group). Drilling was abandoned when uneconomic grades of copper and nickel were intersected. Several iron prospects were drilled and the core was assayed for iron only.

Husky Oil Ltd. explored throughout the area from 1970 to 1973. Airborne radiometric, magnetic and EM surveys were done in 1970 and followed up by prospecting and ground geophysical surveys. One anomaly corresponds to a sulphide showing at Gun Lake covered by Prospecting Permit 1070. Samples from three quartz veins north of the anomaly assayed 13 ppm Ag, 0.23% Cu, 0.007% Ni, 0.102% Pb and 0.018% Zn. The REP claims were staked southeast of Last Lake. The



LEGEND

Drift

Aphebian Sediments: Slate, mudstone, sandstone, quartzite, greywacke, pebble conglomerate

Archean Intrusives: Diorite, gabbro, quartz monzonite

KAMINAK GROUP

Sediments: Slate, argillite, impure sandstone, greywacke, iron formation, conglomerate

Felsic Volcanics: Dacite, rhyolite, quartz, quartz-feldspar porphyry

Mafic Volcanics: Basalt and andesite flows (in part pillowed), tuff and agglomerate

FIGURE 5-4: Geology of the Keewatin Gold Project area (after Heywood, 1973 and Davidson, 1970).

claims covered a showing of quartz-carbonate veins 6 to 150 m in strike length and 0.3 to 0.9 m wide, injected into a carbonatized zone developed in sheared andesite. Thirty pits and trenches were blasted; two quartz samples contained 17 ppm and 84 ppm Au.

The showing was restaked as the IT claims and optioned to Denison Mines Ltd. and Coniagas Mines Ltd. in 1973. The showing was mapped and sampled and the best assay was 48 ppm Au. The claims lapsed. The longitude and latitude for the showing were incorrectly recorded on the National Mineral Inventory Card, 55 K/4 Au 4; as a result the showing was "lost" for several years (Padgham, DIAND Property Examination).

In 1985 Borealis began acquiring land throughout the Rankin-Ennadai belt. Permit 1070 was acquired in January 1985 to cover the REP showing. The SUSAN claims were added to the land holdings in the summer of 1985. Prospecting Permit 1070 and the SUSAN claims were prospected during the summer of 1985. A grid was established and magnetometer, Max-Min, geological and lithogeochemical surveys were completed. Quartz-veined shear zones contain up to 500 ppm Au.

DESCRIPTION

Archean basement rocks of the permit areas are felsic and mafic lavas, pyroclastics, immature clastic sediments and sedimentary exhalites of the Kaminak Group. Volcanic rocks range in composition from basalt to rhyolite, with andesite predominating. Carbonate-, silicate- and sulphide-facies banded iron formation is associated with argillites and shales. The assemblage is intruded by gabbro and quartz-diorite sills and dykes and quartz-feldspar porphyry dykes. Southeast- and southwest-trending faults cut the area. A small diorite plug has intruded along the "Doodle Lake Fault", a southwest-trending fault that transects Prospecting Permits 1079 and 1080. Gold is associated with zones of shearing, iron formations and quartz vein systems.

At the Fat Lake deposit on the SUSAN claims, gold forms blebs and disseminations within quartz-carbonate veins, hosted by a steeply dipping diorite sill. The northern contact of the sill is sheared but in most places the southern contact of the sill is distinct. The sill is bounded by a series of sinistral northeast-trending sulphide-bearing shears. Quartz veins, in places anastomosing, boudinaged, brecciated, layered, folded and transposed, commonly contain calcite, chlorite, pyrite, pyrrhotite, chalcopyrite, galena, sphalerite, arsenopyrite, gold and locally fuchsite, sphalerite and galena associated with visible gold and minor silver.

CURRENT WORK AND RESULTS

Permits 1079, 1080, 1081, 1100, 1101, 1102 were acquired in 1986. During 1986, mapping in the permit areas concentrated on the showings. Showings were sampled and mapping surveys were expanded to trace anomalies. Lithogeochemical and pan concentrate samples were taken and the significant showings were trenched. Limited diamond drilling tested one of the showings on Prospecting Permit 1081. No economically significant mineral concentrations were found within Prospecting Permits 1100 and 1102.

On Prospecting Permit 1070, three trenches were excavated on a conductor formerly covered by the GUN claims. The conductor is attributed to a major zone of shearing within tuffaceous andesites. The west-southwest-trending shear is exposed over a strike length of 55 m and ranges from 1 to 5 m thick. The shear contains up to 10% pyrite and/or pyrrhotite with minor arsenopyrite and magnetite and is cross-cut by west-northwest-trending quartz-feldspar porphyry dykes. Three 45 kg bulk samples taken from the trenches did not contain economic gold concentrations.

Within Prospecting Permit 1081 in the Talc Lake area, a series of silicified, carbonatized shear zones were found to host gold-bearing quartz-carbonate veins. The veins were tested by 83.1 m of diamond drilling in four holes. Core samples contain gold including a 0.5 m intersection of 27 ppm Au.

An iron formation, traced along a strike length of approximately 2.5 km, parallels the Doodle Lake Fault approximately 1 km to the south. Silicate facies in the north changes laterally to carbonate facies over a strike length of 100 m. Small bands of sulphide-facies iron formation, with up to 25% combined pyrite, arsenopyrite and pyrrhotite, are contained within the carbonate facies unit. An anastomosing shear, associated with the iron formation, was traced for a strike length of approximately 2 km. The shear is locally phyllitic and strongly silicified. When observed near the iron formation, it contains up to 20% combined pyrite, chalcopyrite and arsenopyrite. Detailed grid work was carried out at four locales along the iron formation/shear trend and samples were anomalous in gold.

Further geological mapping, plus rock and pan concentrate sampling was undertaken on Prospecting Permits 1081 and 1070 during 1987. On Prospecting Permit 1081, six showings were examined, including oxide-facies iron formation, zones of gossan and carbonatization and shear zones. Gold assays in excess of 100 ppb were yielded by a pyrite-bearing quartz vein and a quartz-feldspar porphyry dyke with pyrite-bearing quartz-carbonate cross-cutting veins. On Prospecting Permit 1070, two quartz veins from the North zone were sampled. The samples yielded 15.5 and 3.3 ppm Au.

SUSAN Claims/Fat Lake Deposit:

In 1986, 46 km of gridding established an east-northeast-trending grid on the east shore of Fat Lake and a northeast-trending grid southeast of "Diorite Lake". Detailed exploration consisted of mapping, prospecting, trenching, magnetometer, VLF EM, MAXMIN and HLEM surveys. Six holes totalling 593 m were drilled to test an EM conductor under Fat Lake and two holes totalling 178 m were drilled to test conductors and fault zones in the Diorite Lake area (North zone).

Subsequent surface sampling and trenching delineated three high-grade gold-bearing zones which were then drilled. At the North zone, 18 holes, totalling 643 m outlined a quartz-carbonate-flooded shear zone, 835 m in strike length. The zone hosts erratic concentrations of gold and plunges sub-vertically to the northeast. A total of 1586 m of drilling in 45 holes confirmed the continuity the gold-bearing zone at depth at the Fat Lake showing. Intersections, 1.0 to 15.0 m in drilled width, of 1.7 to 7.5 ppm Au, were recovered from 304 m of drilling in eight holes in the South Gossan zone.

In 1987, continued exploration on the SUSAN claims and surrounding areas consisted of further gridding, mapping, trenching, channel sampling, magnetometer, VLF EM and MaxMin HLEM surveys. Interpretation of geophysical surveys linked the EM conductor in Fat Lake and the North zone. Results from spring drilling on the Fat Lake Diorite (8 holes, 668 m) resulted in the decision to initiate underground exploration and bulk sampling. A mine grid was established and detailed mapping and channel sampling of quartz veins was done in the area of the mine site. A 70 m decline shaft was excavated during August to access the -20 m level and 75 m of drifting north and south of the decline was completed to evaluate Vein 101 (Fig. 5-5). A pilot scale 100 tpd test mill operated for three days to process 150 t of ore from Vein 101.

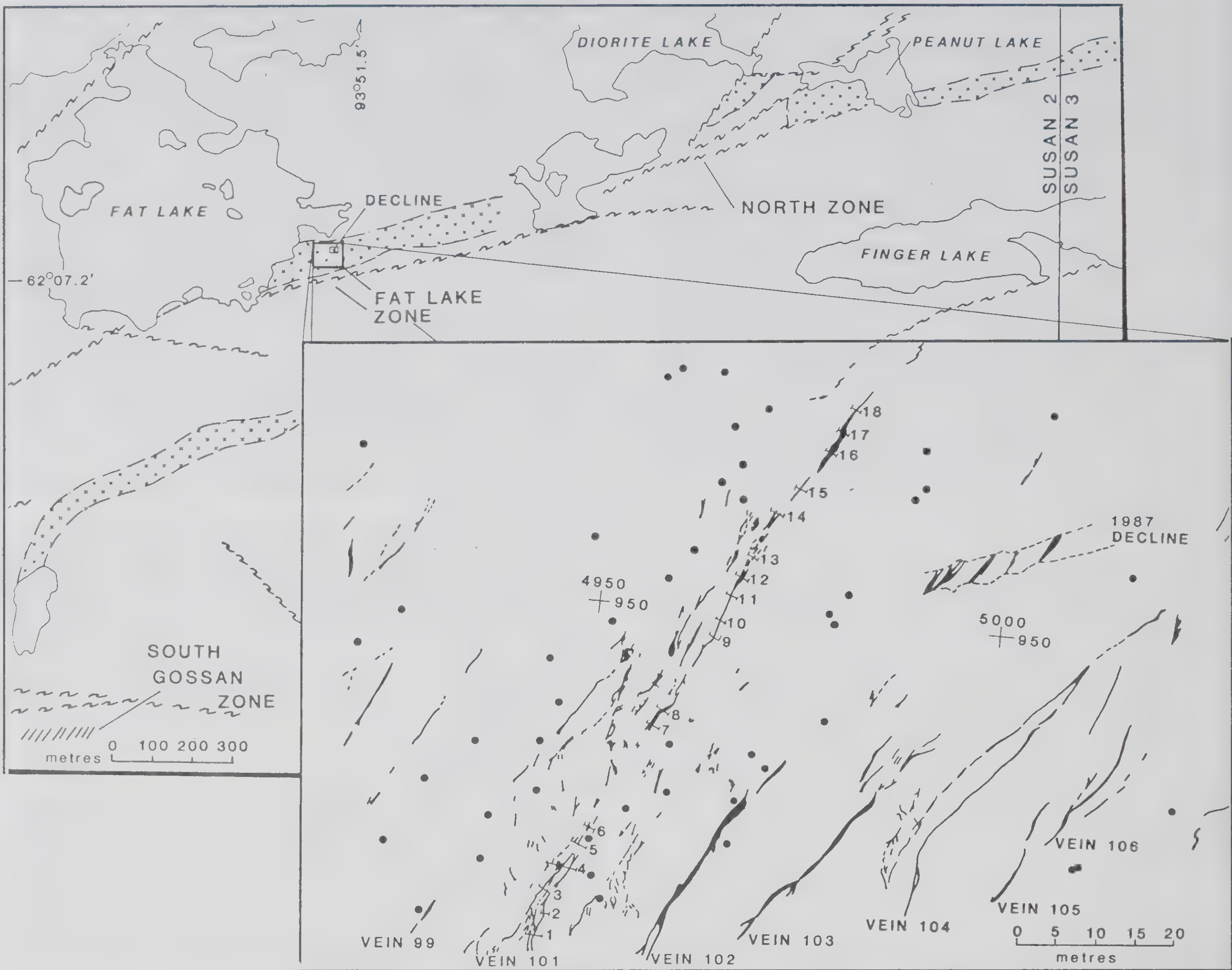


FIGURE 5-5: Gold-bearing quartz vein arrays, Fat Lake deposit (Borealis Exploration, 1988).

Drilling continued in the fall with 25 holes totalling 1270 m targeting Veins 99 to 103 and veins east and west of the decline shaft, a single 112 m hole undercutting a previous hole in North zone and 10 holes totalling 648 m to further evaluate the South Gossan showing. More high-grade veins were identified in the mine area and a 1.10 m intersection of 490 ppm Au was obtained.

HAPPY LAKE PROJECT

Noble Peak Resources Ltd.	Gold
4th Floor, 2338 Hurontario St.	55 L/7,9,10
Mississauga, Ont., L5B 1N1	62°22'-62°37'N, 94°22'-95°00'W

REFERENCES

Davidson (1970); Laporte (1974a); Shilts (1973); Wright (1967).

DIAND assessment reports: 082113, 082544, 082565, 082584, 082703, 082736.

PROPERTY

HAPPY 1-4 (F10115-F10118).
HAPPY 5-6 (F13654-F13655).
HAPPY 7 (F14774).
HAPPY 8 (F14792).
NORM 1-8 (F13657-F13664).
Prospecting Permit 1110 (55 L/7 NW).
Prospecting Permit 1086 (55 L/10 SE).

LOCATION

The Happy Lake project area is north of Happotiyik Lake, approximately 130 km west-southwest of Rankin Inlet and 110 km west-northwest of Whale Cove.

HISTORY

The area was mapped by the GSC in 1952 (Wright, 1967) and again in 1966 (Davidson, 1970).

Between 1949 and 1975 the area of Prospecting Permit 1110 was the focus of intermittent exploration. In 1949 Kasba

LEGEND

Intrusive diorite Complex

Mafic Volcanics

Shear Zone

Quartz Veins

Drill Collar Locations

Channel Sample Locations

4950 / 950 Mine Grid Coordinates

Vein 101 Channel Sampling Results:

Channel	ppm Au	Sample length(cm)
1.	3.84	20
	4.87	15
	0.30	15
	98.74	8
	0.49	20
2.	2.34	20
	148.80	20
	0.31	15
	12.96	22
	98.74	8
	0.49	20
3.	0.04	18
	28.29	20
	4.39	20
	1.30	20
	0.24	20
	1.13	20
	8.78	13
	6.00	7
	0.37	18
4.	2.88	18
	198.86	22
	23.73	20
	61.71	22
	40.46	22
	0.47	20
5.	10.97	22
	10.29	22
6.	1.23	20
	2.85	30
	0.47	20
7.	0.15	30
	40.11	10
	0.37	38
8.	0.42	30
	45.60	30
	0.31	22
9.	0.65	20
	2.09	20
	0.31	28
10.	0.22	18
	55.20	14
	0.13	24
11.	0.53	60
	5.04	25
	0.26	15
12.	0.25	18
	9.05	13
	2.43	19
13.	0.13	18
	2.50	30
	0.99	22
14.	2.64	16
	17.52	34
	5.55	30
	9.50	10
	3.09	10
15.	1.85	18
	54.17	20
	2.09	18
16.	0.42	15
	3.36	15
	4.29	48
	0.29	10
17.	0.97	34
	8.30	35
	5.59	16
18.	0.10	22
	43.20	13
	1.82	17

Exploration Ltd. examined the gold potential of the belt between Quartzite Lake and Padlei Lake. Several gold showings were found, but none warranting staking. In 1961 Giant Yellowknife Mines conducted extensive helicopter supported regional exploration. The PETER claims were staked immediately south of the permit area, some trenching was carried out and 12 holes totalling 1580 m were diamond drilled. Gold content in core was 340 ppb to 680 ppb. Further regional exploration was carried out between 1969 and 1975. Between 1969 and 1971, Penarroya Canada Ltee., in joint venture with Serem Ltee, Rexomines Ltd. and Aquitaine of Canada Ltd., conducted Mission Keewatin, a program of airborne EM and magnetometer surveys followed by ground surveys. Between 1973 and 1975 Noranda Exploration Co. Ltd. carried out the Yandle-Kaminak Project, a regional base metals exploration program. In 1975 U.S. Steel Western Hemisphere Inc. contracted Precambrian Mining Services Ltd. to stake claims and conduct geological, geochemical, EM and magnetometer surveys in the area of anomalies detected during the Penarroya airborne survey.

In 1969, independent prospectors J. Kilgour and P.M. Reid staked the KIR claims on the north shore of Happotiyik Lake, in an area corresponding to Prospecting Permit 1086 and HAPPY 1 and 6. The claims were prospected in 1969 and in 1970, a number of small grids were established and four gold-bearing zones were trenched. Channel samples yielded up to 7 ppm Au over 5 m and 12 ppm Au over 2.3 m. One grab sample assayed 78 ppm Au. The claims were allowed to lapse in 1971.

In 1970 and 1971, the GSC carried out drift prospecting and geochemical sampling in the Kaminak Lake area. Anomalous copper and nickel concentrations were detected.

DESCRIPTION

The claims, Prospecting Permit 1086 and the southwest portion of Prospecting Permit 1110 are underlain by Archean mafic to intermediate massive and pillowed flows and felsic pyroclastics of the Kaminak Group. Pyroclastics range in texture from fine-grained tuffs to agglomerates. Interflow sediments form argillaceous, cherty or carbonate-rich bands within fine-grained tuffs. The assemblage forms a northeast-trending belt.

Archean granodiorite occupies the northwest corner of the claim group and eastern portion on Prospecting Permit 1086 and forms a northeast-trending band across the central area. Hornblende gabbro and metagabbro has intruded between the granodiorite bodies and forms a stock in the southeast corner of the claims. Archean intrusions ranging in composition from granodiorite to tonalite and gabbro to diorite predominate throughout Prospecting Permit 1110 and extend into the southwest portion of Prospecting Permit 1086 and the eastern portion of the NORM claims.

Both the intrusions and supracrustal rocks have been locally sheared sub-parallel to stratigraphy. Shearing is commonly accompanied by silicification, sulphide and iron carbonate enrichment and anomalous gold content.

Northeast- and northwest-trending faults are regional in scale and east-trending faults local. Local small scale folding is found near intrusions. Metamorphic grade increases from south to north, from greenschist to amphibolite facies.

Quartzites and dolomitic stromatolite mounds of the Hurwitz Group are in fault bounded contact, or local unconformably on-lapping contact with Archean rocks and form a southwest-trending band in the southeast of Prospecting Permit 1110 and across the NORM claims.

CURRENT WORK AND RESULTS

Noble Peak Resources Ltd. acquired Prospecting Permits 1110 and 1086 in 1986. HAPPY 1-4 were staked in the spring of 1986. HAPPY 5 and 6 were added to the group in late summer and HAPPY 7 and 8 in the late summer of 1987.

Within the HAPPY claim group, reconnaissance geological mapping, prospecting and sampling during the 1986 and 1987 field seasons identified five showings that were targeted for detailed work (Fig. 5-6). Grids were established over each showing during the 1987 field season and detailed geological mapping in conjunction with rock-chip sampling was carried out on each grid.

The "Tuktu" and "Rabbit" prospects are within an east-northeast-trending volcanic belt that has been intruded by mafic sills and "squeezed" between two granodiorite intrusions. The rocks display gossans, have been sheared and silicified and host anomalous concentrations of gold. The Tuktu gossan is within interflow sediments between mafic volcanics and a gabbro sill. A magnetometer and VLF survey was conducted over the Tuktu grid to aid in geological interpretation. Samples from a "C" horizon soil survey contained less than 10 ppb. However one assay of 3 ppm Au came from an area over a sheared gossan-bearing gabbro sill and corresponded to an assay of 1300 ppb Au from a bedrock sample at the same location. A total of 694.0 m of diamond drilling in six holes tested the main Tuktu gossan which yielded up to 538 ppb Au. Soil samples collected on the "Rabbit" grid yielded 4 to 1100 ppb Au.

The "Weasel" and "Slide" prospects are at, or adjacent to, a contact between mafic volcanic flows and felsic pyroclastics. Shearing sub-parallel to the contact exhibits silicification and iron carbonate enrichment. A total of 1218 m in six diamond-drill holes were drilled on the Weasel Prospect. A high assay of 35 ppm Au was obtained from a 1 m core sample of a silicified shear zone.

The "Strand Creek" prospect is an area of sheared gossanous rocks. Shear zones are locally sulphide enriched.

In 1987, preliminary reconnaissance mapping, prospecting and chip sampling was directed toward the portion (approximately 25%) of Prospecting Permit 1110 that covers Kaminak Group rocks. Gossans are associated with intermediate tuffs in the south and in the north, within tuffaceous rafts included in a wide gradational contact zone between a tonalite intrusion and volcanics. Chip samples were taken of gossans and other areas of alteration, particularly zones of silicification and carbonatization and sulphide enrichment. Average gold content was 10 to 14 ppb. The highest gold assay (3.6 ppm) was associated with anomalous silver, copper and zinc and was obtained from a small gossan within tonalite. A quartz vein sample containing pyrite and chalcopyrite yielded 0.29% Cu.

From 1986 to 1987, prospecting, followed up by gridding, detailed mapping, rock and "C" horizon soil sampling, magnetic and VLF surveys and diamond drilling was carried out in Prospecting Permit 1086. During the 1986 field season eleven gold and base metals showings were found, including the four zones trenched and pitted by Kilgour and Reid in 1970. A 38.2 km grid with 100 m line spacing was established over ten of the showings. The grid area is underlain by north-northeast-trending, near vertically dipping, massive and pillowed basalts interbedded with intermediate tuffs. Argillaceous or cherty chemical sediments are interlayered within the tuff units. Quartz veining is observed throughout the grid area. Two ages of quartz veining were identified; the older set hosts gold.

The zones are sulphide-rich recrystallized quartz veins flanked by gossanous chemical sediments which commonly exhibit fuchsite, chlorite and sericite alteration as well as pyrite, chalcopyrite, pyrrhotite, sphalerite and arsenopyrite. The veins are usually parallel or sub-parallel to bedding and the zones are pervasively sheared. The zones range from 1 to 7 m in width and have been traced for strike lengths in excess of 1 km. Of the 241 samples taken from the grid, 123 assayed greater than 100 ppb Au. The highest assay results were 105 ppm Au for a composite grab, 140 ppm Au across 0.25 m and 5 ppm Au across 7 m. Anomalous amounts of zinc, copper and silver were indicated.

The VLF EM survey over the grid defined two major northwest-trending conductors cross-cutting or flanking sulphidic zones and a weak west-northwest-trending, curvilinear conductor that cross-cuts, at an acute angle, two parallel zones of sulphidic chemical sediments and recrystallized quartz veins.

In 1987, the grid area was extended, magnetic and VLF surveys were completed on the new gridded area and further geochemical sampling was undertaken. A total of 8721 m of diamond drilling in 95 holes tested the 10 zones within the grid area. Drill results suggest that three of the zones form part of the same unit, with a strike length of 1.7 km. Up to 14 ppm Au over 8.0 m core length was intersected within the zones. Gold in four other zones proved to be erratic and discontinuous. The remaining zones were recommended for limited follow-up work to complete evaluation.

In 1987, reconnaissance work outside the grid area outlined a showing of quartz, iron carbonate and carbonate altered shears with 1-3% disseminated pyrite. Assays of up to 13 ppm Au were obtained from chip samples.

A combined magnetic/AEM/VLF survey was flown by Aerodat Ltd., under the direction of MPH Consulting Ltd., in August, 1987. The survey covered 1075 line-km over portions of Permit 1086 and the adjoining NORM and HAPPY claims. The surveys identified 31 AEM conductive zones. A preliminary ground check of anomalies determined that the conductors were sulphide-rich bands within volcanic tuffs and flows.

PROSPECTING PERMITS 1082 & 1083

Borealis Exploration Ltd.	Gold
960, 540 5th Ave. SW	55 L/6 SE, SW
Calgary, Alta. T2P 0M2	62°15'-62°22'30"N
	95°00'-95°30'W

REFERENCES

Davidson (1970).
DIAND assessment reports: 082139, 082675.

PROPERTY

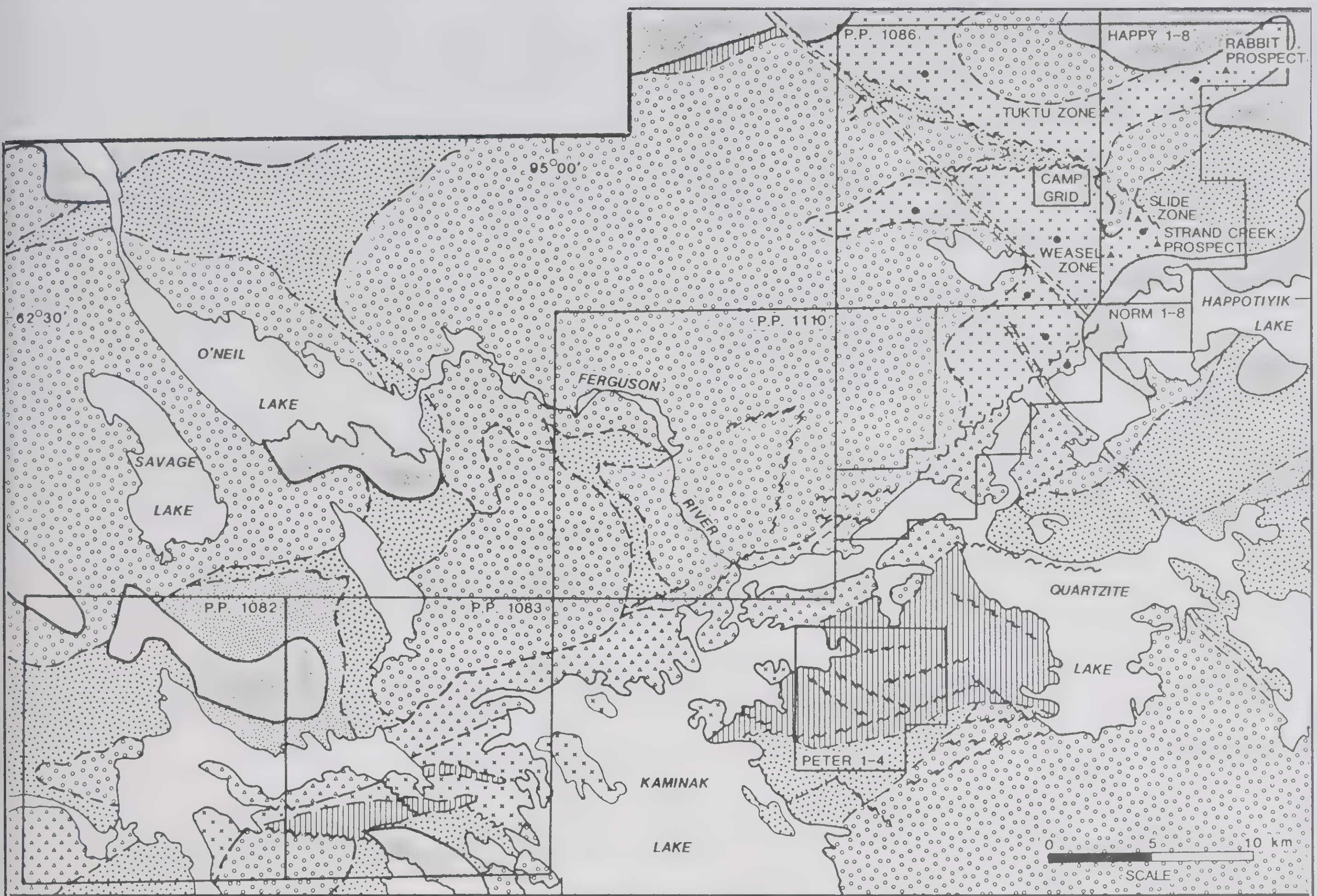
Prospecting Permits 1082, 1083.

LOCATION

The permits are approximately 126 km west of the Hamlet of Whale Cove, on the north shore of Kaminak Lake.

HISTORY

The first reporded work in the area was by Kasba Exploration Ltd. in 1949. Prospecting between Quartzite and Padlei lakes resulted in a number of gold showings being found, although none were staked.



Glacial Drift

HELIKIAN DIABASE: Diabase, quartz diabase

HURWITZ GROUP: Orthoquartzite, greywacke, siltstone, slate, conglomerate and andesite

ARCHEAN INTRUSIVE ROCKS: Hornblende tonalite, hornblende gabbro diorite ± inclusion of amphibolite

KAMINAK GROUP

SEDIMENTS: Greywacke and slate, minor tuff, volcaniclastic pebble conglomerate, iron formation, pelitic schist

FELSIC VOLCANICS: Felsic tuff, agglomerate, flow breccia, associated felsic intrusions

MAFIC VOLCANICS: Massive or pillowed basalts and andesites, hornblende schists and amphibolite

UNDIFFERENTIATED FELSIC AND MAFIC VOLCANICS: can include mafic flows with intercalated felsic flows and tuffs

Shears or fault zones

FIGURE 5-6: *Geology and properties of the Kaminak Lake area (after Davidson, 1970).*

In 1961, during extensive regional exploration, Giant Yellowknife Mines Ltd. found a pyrite showing in the Dagwin Lake area. AEM conductors in the area were prospected and attributed to graphite with low copper or gold content. A number of quartz veins on the west shore of Kaminak Lake were examined, trenched and drilled.

Pennaroya Ltee carried out regional exploration from 1969 to 1971. An area on the north shore of Kaminak Lake within the current permit area was examined, but no results were reported.

Republic Resources Ltd. conducted an airborne scintillometer survey over the area in 1971. Ground follow up outlined four geochemical anomalies in the area of Kaminak Lake. A sample from within the current permit area yielded 0.68 ppm Au. Two showings south of O'Neil Lake, to the west of Kaminak Lake, were diamond drilled. The best intersection yielded 10.28 ppm Au over 30 cm.

In 1975, Noranda Exploration and United States Steel Corporation were active in the area. Noranda conducted airborne and ground EM and magnetometer surveys. Two conductors were defined and the one south of Kaminak Lake was drilled. No gold assays were reported. United States Steel Corporation followed up on anomalies defined by Pennaroya's airborne surveys. Anomalies on the north shore of Kaminak Lake were sampled. Two samples were anomalous in gold.

In 1985 Borealis Exploration Ltd. began the Keewatin Gold Project to evaluate gold showings in the Rankin-Ennadai belt.

DESCRIPTION

A downfaulted synclinal trough of Aphebian Hurwitz Group, massive to pillowed andesites, orthoquartzite, conglomerate, greywacke, siltstone and impure quartzites transect the permit areas. Hurwitz Group rocks lie unconformably on Archean rocks of the Kaminak Group. The basal contact of the Hurwitz Group is typically sheared.

In this area, the Kaminak Group comprises massive and pillowed basalts and andesites, with synvolcanic intrusions, mafic flows with intercalated felsic flows, felsic tuffs with intercalated sediments and greywacke, slates, volcaniclastics and iron formation. The rocks are intruded in the south and northeast by Archean tonalite. The centre of the permit area is covered with Quaternary till deposits (Fig. 5-6).

A number of west- and northwest-trending faults were noted on the south limb of the synclinal trough. Regional metamorphism in the permit area is greenschist facies, passing to lower amphibolite facies in the north.

CURRENT WORK AND RESULTS

Prospecting permits 1082 and 1083 were acquired in 1986. During the 1986 and 1987 field seasons, geological mapping and rock and pan concentrate sampling were carried out. Mapping was concentrated around showings. Within Prospecting Permit 1082, a series of rhyolite dykes trending 070°, 3 to 5 m wide with strike lengths of up to several hundred metres, contain trace to 1% disseminated pyrite. Contact zones are 1 to 2 m in width and exhibit sericite alteration, silicification and up to 50% pyrite, pyrrhotite and arsenopyrite. Quartz veins, 1 to 60 cm in width, are associated with the dykes in "ladder" style orientation. The veins can be traced for up to several hundred metres and locally contain pyrite, chalcopyrite, galena, arsenopyrite and malachite. Of the 34 samples taken from the contact zone and quartz veins, only 12 assayed less than 25 ppb Au. Assays for the intrusive suite ranged from 25 ppb Au to 750 ppm Au. One grain of visible gold was noted in a pan concentrate sample. Further sampling of the same quartz vein system in 1987, assayed between 7.2 ppm and 40.8 ppm Au. Assays of up to 1.58 ppm Au were obtained from the sheared, pyrite-bearing contact of a quartz-feldspar porphyry dyke that was traced discontinuously for 500 m. A series of quartz veins, intruded along the sheared contact of a tonalite stock in the centre of Prospecting Permit 1083, were found to contain chalcopyrite, pyrite and trace galena, with local argentite. Assays of samples taken in 1986 and 1987 range from 146 ppb Au to 10.6 ppm Au.

PETER CLAIMS

Borealis Exploration Ltd.	Gold
960, 540 5th Ave. SW	55 L/07
Calgary, Alta., T2P 0M2	62°18'00"-62°21'35"N
	94°38'20"-94°46'40"W

REFERENCES

Davidson (1970); Wright (1967).
DIAND assessment report: 082599.

PROPERTY

PETER 1-4 (F10110-F10113).

LOCATION

The claims are approximately 100 km west-northwest of Whale Cove, between Quartzite and Kaminak lakes (Fig. 5-6).

HISTORY

A general history of the area is outlined in the description of Prospecting Permits 1082 and 1083 (Noble Peak Resources Ltd. "Happy Lake" Project).

The PETER group of 108 claims was held by Giant Yellowknife Mines during the early 1960s. Samples from a belt of sericite schist, traceable for a strike length of 3.2 km and up to 1.6 km wide, yielded encouraging gold assays. In 1961, 1600 m of diamond drilling in 12 holes failed to outline any economic gold and the claims were abandoned.

DESCRIPTION

Kaminak Group felsic pyroclastic breccias and agglomerates, with lapilli and bomb tuffs, intercalated with mafic flows are found between Quartzite and Kaminak lakes (Fig. 5-6). Near Quartzite Lake, local pockets of fine-grained crystal tuff are interlayered with greywacke and conglomerate. In the north, Aphebian orthoquartzites overlie the Kaminak Group rocks. A number of quartz-feldspar porphyry bodies intrude the volcanic assemblage.

A system of curvilinear faults, crossing PETER 2, trends northwest in the western portion of the claim, to west-northwest further east. A synformal structure is developed east of this fault splay. Folding is believed to be contemporaneous with shearing.

A sericite schist unit trends in a northeasterly direction across the claims. It is 1.5 km in width and traceable for 4 km.

The protolith is believed to have been rhyolite tuffs that were subsequently highly sheared. Locally, the schists contain 1% to 15% pyrite and pyrrhotite disseminated along favourable layers. Characteristic mineralogy is sericite, talc, actinolite/tremolite, carbonate and minor chlorite. Quartz flooding and carbonate alteration are found within the unit. Larger quartz veins within quartz-flooded zones contain trace chalcopyrite and sphalerite in places.

CURRENT WORK AND RESULTS

In 1986, Borealis Exploration Ltd. acquired PETER 1-4 and reconnaissance mapping and prospecting concentrated on the sericite schist units, known anomalies and cross-cutting faults. Of the 50 lithogeochemical samples collected, three samples of quartz and one sample of sericite schist contained anomalous gold. Thirty pan concentrate samples were taken, but no visible gold was observed.

ERIC AND MAGUSE LAKE PROSPECTS

Sunmist Energy '85 Inc.	Gold
206, 215 10th Ave. SW	55 E/11,10,6
Calgary, Alta., T2R 0A4	61°35'N, 95°12'W

REFERENCES

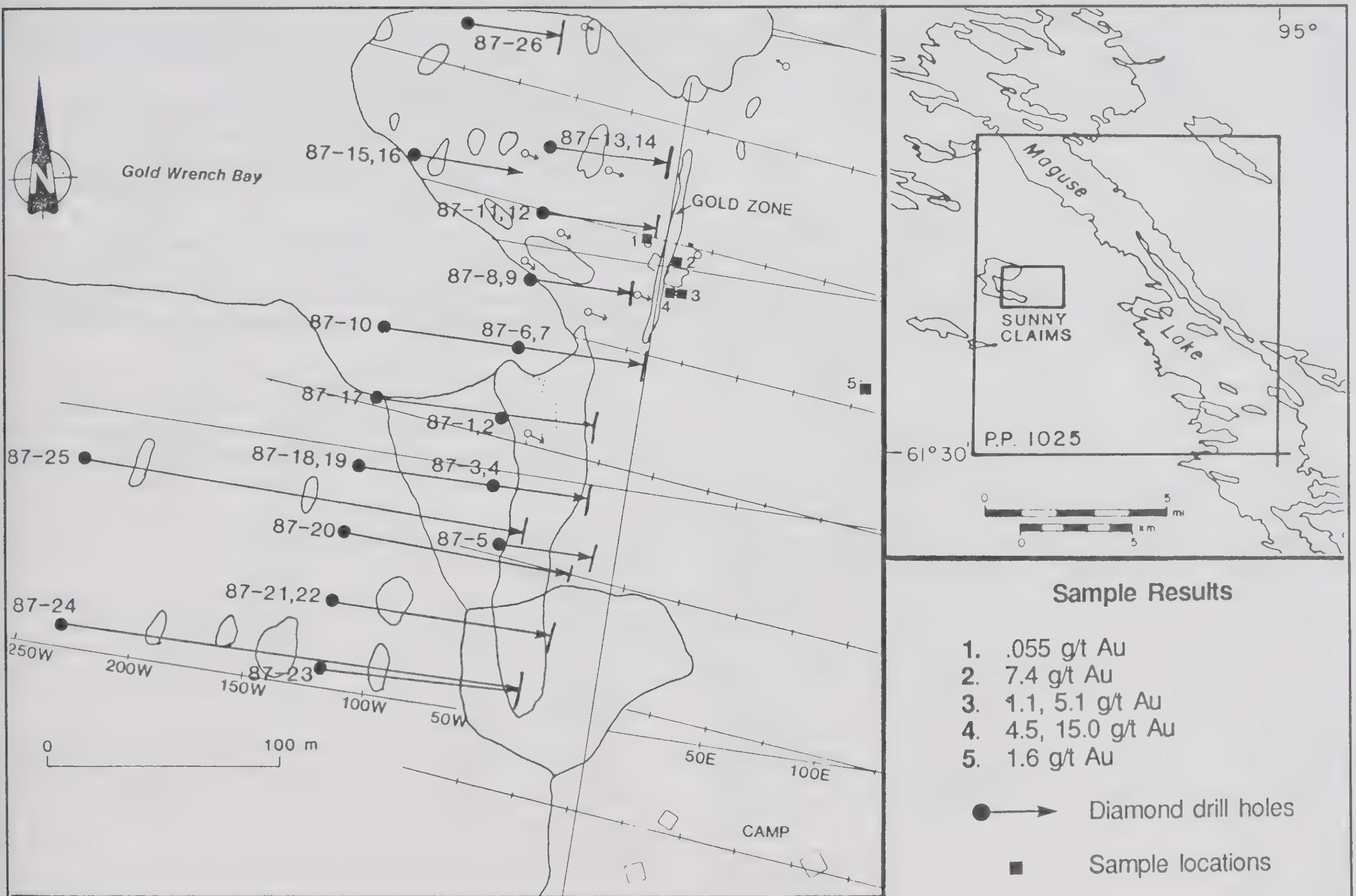
Laporte (1987).
DIAND assessment reports: 082090, 082731.

PROPERTY

MISTY 1-23 (F12332-F12354).
SUNNY 1-2 (F12355-F12356).
Prospecting Permit 1025.

LOCATION

The property is approximately 100 km west-northwest of Arviat and 325 km north of Churchill. The claims straddle the narrow central reaches of Maguse Lake (Fig. 5-7).



Eric Lake Gold Deposit
Intersections of > 1 ppm Au over > 1 m drilled width

Hole No.	From (m)	To (m)	Gold g/t
87-2	66.2	78.7	1.6
87-4	77.6	84.3	8.7
87-6	54.0	55.8	9.3
	63.9	65.4	6.0
87-11	71.6	73.5	25.0
87-18	145.8	149.0	29.5
87-23	140.2	141.7	1.2

FIGURE 5-7: Drill hole plan and sample location, SUNNY claims.

HISTORY

ERIC 1-36 were staked in 1966 and 1967 to cover a gold showing discovered by Selco Northern Ltd. prospectors. The showing was geophysically and geochemically surveyed. Six Winkie diamond-drill holes, totalling 44.6 m, tested a 46 m strike length of the zone. In 1968 Prospecting Permit 57 was acquired and an aggregate of 1238.4 m of diamond drilling in 12 holes, geological mapping, magnetic surveys, geochemical surveys and prospecting was done. Results indicated that the showing was subeconomic (Thorpe, 1972). The claims and permit lapsed between 1968 and 1970.

L.K. Lytte staked GOLD 1-6 in 1972, covering the showing (GOLD 2 and 3) and surrounding areas. In 1973 Mr. Lytte excavated trenches on GOLD 2 and 3. The other claims lapsed. GOLD 2 and 3 were transferred to L. Dempster in 1975. Mr. Dempster carried out further trenching and channel sampling of the showing in 1979. Two channel samples were collected and assayed 471.44 ppm Au over 15 cm and 23.6 ppm Au over 106.7 cm. GOLD 2 and 3 lapsed in 1979 and 1982 respectively.

LAB 1 and 2 were staked adjacent to GOLD 3 in 1980 and in 1982, LAB 3 was staked to replace GOLD 3. The claims underwent a series of transfers between 1983 to 1984. In 1984, M. Magrum acquired Prospecting Permit 1025 surrounding the area of the claims.

DESCRIPTION

The property is underlain by volcanic and sedimentary rocks of the Archean Kaminak Group, intruded in the southwest by Archean hornblende tonalite of the Turquetil Complex. Phyllite and schist, derived from the typical Archean greywacke-slate assemblage, quartzites, mafic volcanics, subordinate intermediate crystal tuff and felsic-ash to lapilli tuff with cherty interbeds underlie the eastern half of the permit area. Magnetite iron formation boulders were observed in the area of AEM anomalies and form discontinuous beds within other rock units. The iron formation contains up to 5% sulphides, most commonly pyrrhotite with lesser pyrite. Aeromagnetic data indicates that the iron formation forms extensive arcuate layers within the metasedimentary package. Greenschist-facies mafic metavolcanic rocks, locally intercalated with more felsic flows, tephra and graphite schists, outcrop along the northern edge of the permit area and to the west in contact with the tonalite intrusion (Davidson, 1970).

The Eric showing on SUNNY 2 is near the mafic volcanic-tonalite contact. Detailed mapping by Selco Northern Ltd. indicates the showing is in north-striking, steeply dipping amphibolitic andesite enclosing thin layers of metamorphosed rhyolite tuff and flows. Gold is hosted by a zone of silicified andesite underlain by a rhyolite tuff layer 1.5 m thick. The zone widens from less than 1 m in the north to 15.2 m in the south and contains 5% to 10% sulphides. Pyrrhotite and minor chalcopyrite, pyrite and sphalerite form streaks and lenses in the amphibolite bands and intergrowths with wall-rock inclusions in the quartz veins. Rare specks of visible gold have been noted. Gold is erratically distributed and shows no correlation to quartz and sulphide content.

CURRENT WORK AND RESULTS

Sunmist Energy acquired the LAB claims and Prospecting Permit 1025 in 1986. MISTY 1-6 and 8-23 were staked in 1986 to encompass the area of Prospecting Permit 1025. The claims superseded Prospecting Permit 1025 on its expiry date in January 1987. MISTY 7 is contiguous with the MISTY claim group and covers ground north of the original permit area. LAB 1 and 2 were surrendered in 1986 due to staking irregularities and were replaced by SUNNY 1 and 2 respectively.

In 1986, a two-person crew carried out reconnaissance geological mapping and prospecting with follow-up detailed mapping, overburden geochemistry and ground magnetometer and VLF EM surveys.

A showing of Ag-Bi-Pb-Zn-Au, referred to as the Eastern Quartz vein, was identified in an amphibolite unit with crystal and ash tuff interbeds. A 2.7 km grid was laid out over the showing and magnetic and VLF surveys were carried out along with detailed geological mapping. Coincident magnetic and VLF anomalies extend northeast from the Eastern Quartz vein for 200 m. A second weak conductor associated with small en-echelon quartz veins was delineated northeast of the Eastern Quartz vein. Three of 15 samples taken assayed from 0.7 to 0.9 ppm Au. One sample of quartz with bismuthinite assayed 421 ppm Ag.

A reconnaissance overburden geochemical survey was carried out 20 m up ice to 450 m down ice over the Eric showing. Analytical results indicated an anomalous pattern of gold enrichment centred on the showing.

In 1987, a combined magnetometer/EM airborne survey and a till sampling survey covered a large part of the claim group. The Ghostly Lake grid was established to cover anomalous tills south of Eric Lake and controlled mapping, magnetic and VLF EM surveys.

Thirty-one drill holes totalling 4186.4 m were collared on the Eric Lake zone, including six holes (616.0 m) drilled on magnetic anomalies north and west of the structure. Drilling tested the zone to a depth of 210 m and indicated gold grades become erratic at depth.

A second phase of drilling thirteen holes (1570.0 m) was designed to test the provenance of strongly anomalous till samples on the Ghostly Lake grid. No gold-bearing zones were intersected. It was concluded that the anomalies are not close to a bedrock source.

TURQUETIL LAKE PROJECT

Dejour Mines Ltd.	Gold
390 Bay St., Suite 2000	55 E/13, L/4; 65 H/16, I/1
Toronto, Ont., M5S 2R9	Centred on
	62°00'W, 96°00'N

REFERENCES

Laporte (1983b).
DIAND assessment report: 082549.

PROPERTY

SPI 1 (F14773).
SPI 2-18 (F14775-F14791).
JOYCE 1 (F06453).

LOCATION

The property is on the northwest shore of Turquetil Lake, approximately 125 km southwest of the Hamlet of Whale Cove and 60 km northwest of Eskimo Point (Fig. 5-8).

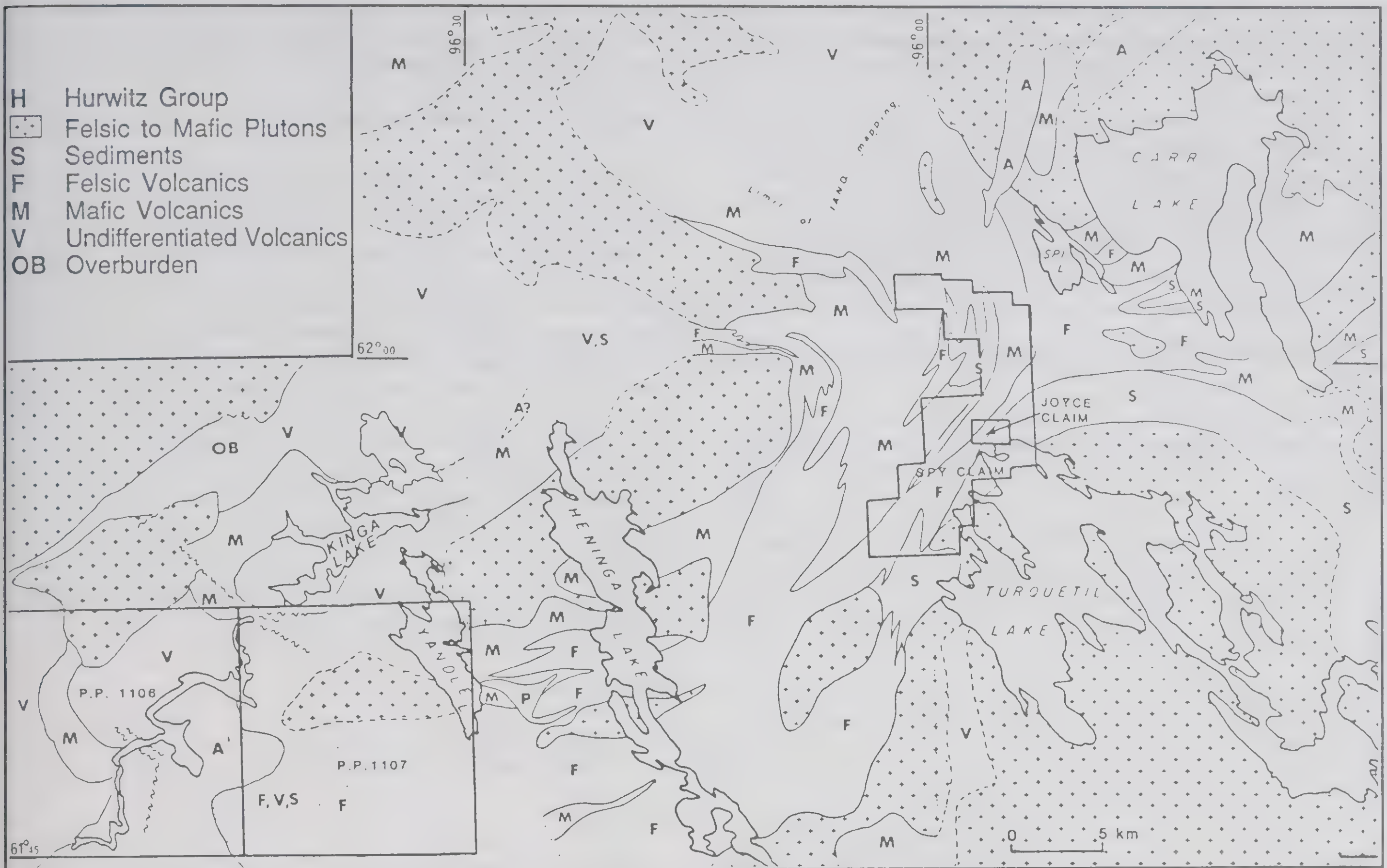


FIGURE 5-8: Geology, property and permits of the Turquetil Lake area (geology after Ridler and Shilts, 1974).

HISTORY

During a regional reconnaissance in 1961 and 1962, Giant Yellowknife Mines acquired the current Turquetil Lake Project area as Prospecting Permit 9. Trenching and four drill holes aggregating 86.6 m were completed. One hole intersected 2.0 ppm Au over 4.27 m and 3.0 ppm Au over 1.22 m from a zone of quartz veining, with carbonate, chlorite, pyrite and arsenopyrite.

In 1969 an airborne magnetometer and EM survey, flown by Geoterrex for Penarroya Ltee, covered the present day JOYCE claim. Pennarroya acquired BEL 1-233 over the area in 1970, which lapsed over the period from 1971 to 1978.

In 1971, Canadian Superior Exploration flew a multisensor airborne survey that outlined a number of weak conductors with coincident magnetic anomalies.

U.S. Steel (now Essex Minerals Company) staked the RAT and the TAU claims in 1975. In 1976, one hole was drilled on what is now staked as the JOYCE claim; it intersected 5.5 ppm Au over 7.9 m true width. Geological mapping, magnetometer, IP and VLF EM surveys were carried out in 1977 and outlined a series of west-southwest-trending IP anomalies flanking and paralleling linear magnetic highs. Six holes were drilled during 1978 to test geophysical targets, but failed to delineate economic concentrations of gold. The claims lapsed in 1979.

The JOYCE claim was staked in 1984 and the SPI claims in 1987. The claims are held jointly by Dejour Mines Ltd. and Noble Peak Resources.

DESCRIPTION

The property is underlain by one cycle of felsic and mafic volcanics, ranging from massive to pillowed basalt flows with intercalated flow top breccias in the south, to felsic breccias and intermediate to felsic lapilli tuffs and agglomerate in the north. In the south and central portion of the property, shear-hosted carbonate alteration with boudins and lenses of carbonate-quartz replace mafic volcanics interlayered with minor felsic tuff and cherty lenses.

The supracrustals are synclinally folded. Quartz-carbonate stockworks, as well as gold, sulphides and arsenides, are hosted in iron-carbonatized mafic volcanics. The volcanics are intruded to the southwest by the Turquetil Batholith. The rocks are regionally metamorphosed to greenschist facies reaching upper greenschist facies within contact aureoles of granitic intrusions. Hydrothermal alteration is pervasive throughout the property, resulting in leaching and carbonatization of the rocks.

CURRENT WORK AND RESULTS

Geological mapping, rock sampling and channel sampling was carried out during the 1987 field season. Carbonatized intermediate to mafic volcanics, iron carbonate lenses, carbonatized basalt flows and iron oxides were sampled in the south and central portions of the property. In the north, all rock types, particularly those showing evidence of hydrothermal alteration, were sampled. Where there was sufficient exposure of outcrop, channel samples were cut along traverses. Elevated gold was detected in carbonatized, leached and quartz-veined

mafic volcanics in the north and east central area of the claim group. The highest gold assay, 17 ppm Au, was obtained from quartz-veined mafic volcanic rocks in old trenches on the JOYCE claim.

PERMITS 1106, 1107

Borealis Exploration Ltd.	Gold, Silver
960, 540 5th Ave. SW	65 H/15
Calgary, Alta., T2P 0M2	61°45'-61°52'N
	96°30'-97°00'W

REFERENCES

DIAND assessment reports: 019954, 082142.

PROPERTY

Prospecting Permits 1106, 1107.

LOCATION

The permits are along the Padlei River, 20 km northeast of Henik Lake. The area is approximately 370 km north-northwest of Churchill, Manitoba (Fig. 5-8).

HISTORY

Kasba Exploration regionally prospected the area between Padlei and Quartzite lakes in 1949 and 1950. Visible gold was panned from quartz pebble conglomerates in the Padlei Lake area. Samples collected on the LOWO claims in the Heninga Lake area assayed as high as 167 ppm Au.

In 1969, the DEN claims in the Henik Lake area were mapped by Denison Mines Ltd. A pyritic quartz pebble conglomerate was targeted for further evaluation of uranium and gold potential. Drilling in 1970 intersected the basal quartz pebble conglomerate which was assayed for uranium only.

In 1969, Enex Mines Ltd. prospected and conducted scintillometer surveys at Kinga and Jens lakes. Two radioactive conglomerate showings were found. In 1970, Falconbridge Nickel Mines Ltd. drilled seven holes but encountered no economic mineral concentrations.

Noranda Exploration Co. Ltd. flew 625 line-km of EM and magnetic surveys over the Yandle Lake area during 1974. Five conductors were delineated that were found to be associated with iron formation.

Western Mines Ltd. conducted sampling on the old DEN claims. Samples were analyzed for gold, uranium, thorium and base metals. The highest gold assay, 0.6 ppm, was obtained from a quartz pebble conglomerate.

St. Joseph Exploration Ltd. drilled 1257 m in nine holes in the Heninga Lake area. The best intersection was 1.7 ppm Au over a 1.3 m core length.

DESCRIPTION

The permit area covers Archean felsic and mafic volcanics, pyroclastics and sediments. Discontinuous beds of oxide-facies iron formation are intercalated with the volcanics. The rocks are intruded by mafic dykes and granitic stocks in the west portion of the permit area. A synform axis trends from Wolks Lake to Kinga Lake. Hurwitz quartz pebble conglomerates, quartzites and shales unconformably overlie the Archean rocks. In the Padlei River area, black argillaceous shales, 50 to 100 m thick, grade into sandstones and siltstones with a few pebbly units. The basal conglomerate is gold bearing and radioactive. At Wolks Lake and Kinga Lake, the unit contains 90-95% quartz pebble fragments and up to 10% jasper fragments. At Kinga Lake, 5-15% pyrite was contained within the matrix of monomictic quartz conglomerate.

CURRENT WORK AND RESULTS

Reconnaissance mapping during 1986 concentrated on areas around showings. Rock and pan concentrate samples were taken from the showings and surrounding areas. Three of 15 pan concentrate samples contained visible gold in the first fraction. The three samples were taken in different localities of quartz pebble conglomerate outcrop. Forty-two samples of conglomerate were taken; ten assayed greater than 50 ppb Au. The highest assay from the conglomerate was 412 ppb Au. Ten samples of quartz pebble conglomerate collected in the Kinga Lake area assayed as high as 143 ppb Au, with seven samples over 50 ppb.

SUNDOG PROJECT

Homestake Mineral Development Co.	Gold, Base Metals
1000 - 700 W Pender St.	65 G/8
Vancouver, B.C., V6C 1G8	61°25'N, 98°10'W
(50/50 JV with Abermin Corporation)	

REFERENCES

Laporte (1987).
DIAND assessment report: 082609.

PROPERTY

SUNDOG 1 (F12150).

LOCATION

The claim is approximately 280 km northwest of Churchill, Manitoba, 11 km northeast of Cullaton Lake.

HISTORY

The first recorded exploration in the area was in 1948 by Hudson Bay Mining and Smelting. Nine holes were drilled in quartzite at a showing near Bernier Lake. The best assay was 15.42 ppm Au over 3 m.

From 1961 to 1965, Selco Exploration Ltd. conducted regional exploration of the area between 61°00'-62°00'N and 96°00'-99°00'W. A number of gold showings were discovered, including the "B zone", the Shear Lake deposit and the MacDonald showing. The "B zone" and the Shear Lake deposit were brought into production by a consortium of companies under the name Cullaton Lake Gold Mines Ltd. The mine operated between 1981 and 1985 and was then placed on caretaker status due to low gold prices. Estimated proven and probable reserves remaining were 81 455 t grading 16.8 ppm Au.

The GREG claims, approximately 6 km northwest of SUNDOG 1, were staked by Selco to cover two gold-bearing zones in silicified, chloritized quartz-feldspar-biotite schists. The property was allowed to lapse after mapping, trenching and boulder sampling. Esso Resources Canada staked the BANSHEE claim over the showings in 1981. The showings were re-examined and 14 holes totalling 202 m were diamond drilled. Up to 3.98 ppm Au over 3.05 m and 9.58 ppm Au over 0.33 m was intersected.

The MIKE claims were staked by Suncor Inc. in 1983, immediately southwest of SUNDOG 1. A grid was established over the MIKE 1 and 2 claims to follow up on a magnetic linear and an anomalous lake sediment sample. Ground magnetometer and VLF surveys were conducted.

DESCRIPTION

The claim covers the western limb of a south-southeast-plunging anticline. Regionally, clastic and intermediate to mafic volcanics and related synvolcanic intrusions of the Archean Henik Group are unconformably overlain by Proterozoic mature sediments, slate, shale, siltstone and minor greywacke of the Hurwitz Group. The Archean and Proterozoic assemblage is in fault contact to the west with impure quartzite of the Hurwitz Group (Fig. 5-9).

Within the gridded area of the claim, siltstones and greywackes predominate, interbedded with subordinate basalts, gabbro and quartz-feldspar porphyry. Four distinctive greywacke units were identified on the property. The first, a very fine-grained siliceous rock with quartz eyes and minor disseminated sulphides, underlays the northwest portion of the gridded area. "Clean to dirty" greywackes underlie most of the grid area and are fine grained, slightly phyllitic, siliceous to carbonate-rich rocks. A phyllitic to schistose greywacke/siltstone unit is compositionally layered or laminated and highly carbonatized. All greywacke units locally host quartz-tourmaline veins. A unit of mudstone interlayered with volcanics in the south of the claim hosts quartz veins and stringers. Isolated mafic volcanics outcrop in an area at the north end of the grid and usually contain 5% pyrrhotite with local concentrations of magnetite and quartz eyes. Quartz veining is rare in the mafic volcanics.

CURRENT WORK AND RESULTS

In 1986 the MacDonald showing, discovered by Selco in 1961, was re-examined. Rock and panned concentrate samples were collected. The best assays were 62.8 ppm Au and 8.6 ppm Ag. The SUNDOG 1 claim was staked to cover the showing, and held by Abermin Corporation.

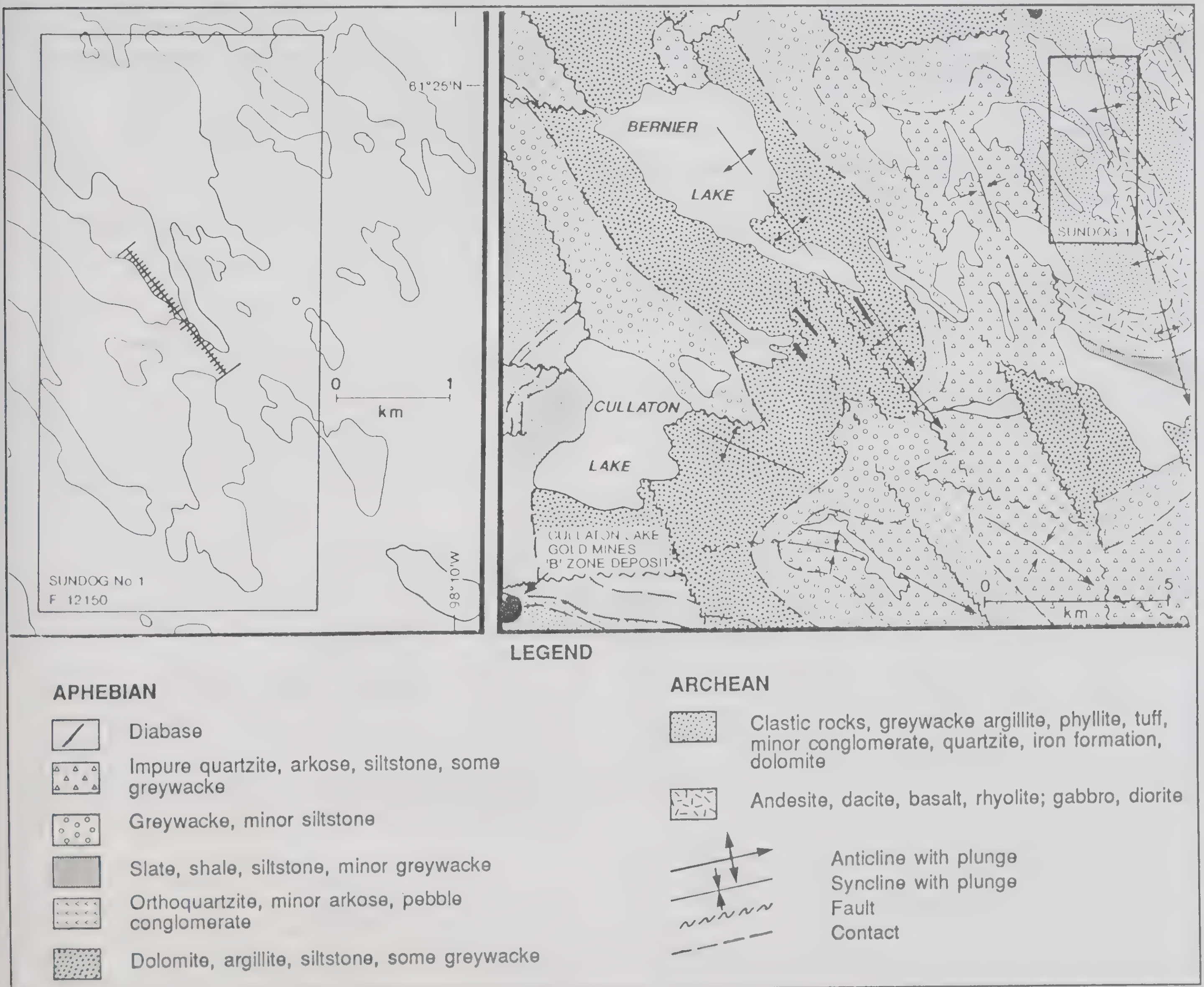


FIGURE 5-9: Geology of the SUNDOG claim (after Eade, 1974).

During the 1987 field season a grid with a baseline orientation of 140° and cross line spacing of 20 m was established along the peninsula that separates Camp and Peninsula lakes. The grid area was mapped in detail and trenching targets were identified. A number of trenches and pits were excavated over areas of extensive quartz veining. Some of the pits established in 1986 during the initial property evaluation were enlarged. Trenches are up to 45 m long, 2 m wide and 2 m deep. Pan concentrate and quartz vein samples were collected from the trenches. Anomalous copper, lead, zinc and arsenic content was detected in the samples.

A VLF EM survey, covering 25 line-km of the grid area, detected a number of conductors, none of which could be correlated with known auriferous veins.

Humus samples were collected at 8 m intervals over portions of the grid area. Several multiline copper, silver and arsenic anomalies were detected. Gold concentrations were erratic.

SANDYBEACH PROPERTY

Claude Resources	Gold, Uranium
310, 224 4th Ave. S	65 B/4 NW,
P.O. Box 7380	65 B/4 SW
Saskatoon, Sask., S7K 4E4	60°07'N, 99°55'W

REFERENCES

Eade (1972); Charbonneau and Swettenham (1986).
DIAND assessment report: 082754.

PROPERTY

JAN 1 (F13102).
JAN 2 (F13099).
Prospecting Permits 1153, 1154.

LOCATION

The Sandybeach property is 320 km north of Lynn Lake, Manitoba and 144 km south-southwest of Cullaton Lake (Fig. 5-10).

HISTORY

All previous work in the area was carried out by the GSC. The area was mapped in 1952 as part of a geological reconnaissance of the southern District of Keewatin and from 1969 to 1970 by Eade (1973). A GSC airborne gamma-ray spectrometer survey flown in 1978 detected an anomaly on the north shore of Sandybeach Lake. In 1985, a follow-up ground survey (Charbonneau and Swettenham, 1986) found sulphide-bearing calcsilicate boulders. The boulders contained visible gold and scheelite and assayed greater than 1000 ppm U and up to 12.6 ppm Au.

DESCRIPTION

The claim group covers Archean greywackes and argillites, now metamorphosed to paragneisses, paraschists and meta-arkoses. The gneisses are banded, the result of relict bedding and have abundant pegmatite and granite stringers. Narrow bands, 2 to 8 cm thick, of plagioclase-rich meta-arkose are developed in the gneisses. The sediments have been affected regionally by amphibolite-grade metamorphism and locally by contact metamorphism.

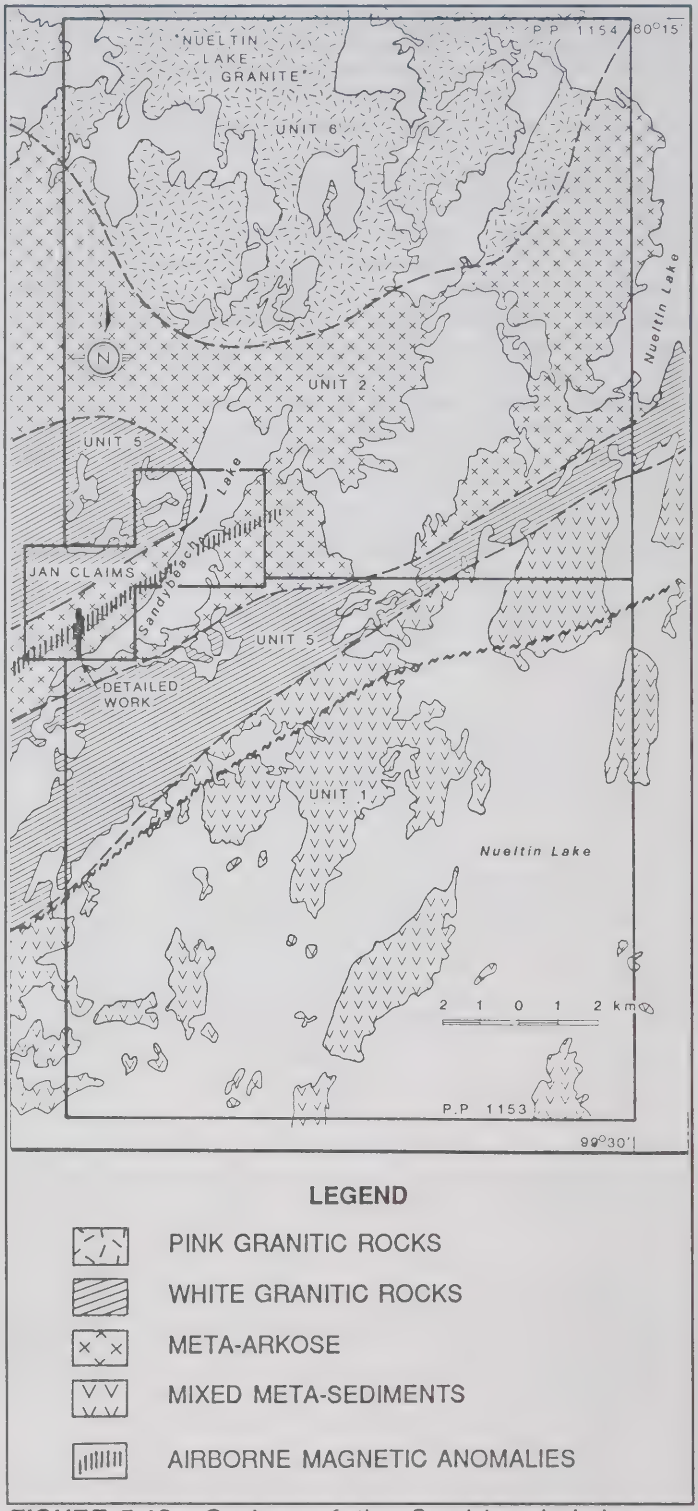


FIGURE 5-10: Geology of the Sandybeach Lake area (after DIAND assessment report 082754 and Eade, 1973).

An elongate granodiorite pluton, Aphebian in age, intrudes the sediments. The rock is medium to coarse grained, in places porphyritic and locally weakly foliated. Biotite, in places accompanied by hornblende, forms the mafic component. Tourmaline is abundant. Scattered garnets and inclusions of paragneiss and meta-arkose are found within the pluton (Fig. 5-10).

The "Nueltin Lake Granite" intrudes both Archean and Aphebian rocks. A mineral thought to be Th-U-rich allanite, altered to bastnaesite, is found within the biotite grains.

Schistosity is sub-parallel to bedding and trends east to northeasterly. The rocks have been relatively undisturbed by the intrusion of the "Nueltin Lake Granite". An east-northeast-trending fault transects the southeast corner of the property. The fault is thought to have been re-activated during the Hudsonian Orogeny by the intrusion of the "Nueltin Lake Granite".

CURRENT WORK AND RESULTS

In 1986 Claude Resources staked JAN 1 and JAN 2 to cover the boulder showings. Prospecting Permits 1153 and 1154 were subsequently acquired in 1987.

During the summers of 1986 and 1987, reconnaissance prospecting and boulder sampling was conducted on JAN 1 and 2. In 1987 a 1 km baseline was cut for sampling control and 36 samples were collected. Assays of up to 87 ppm Au and 0.641% U_3O_8 were obtained from one boulder.

MELIADINE RIVER PROJECT

Consolidated Five Star Resources Ltd.	Gold
10250 - 101 St.	55 J/13, K/16, N/1
Edmonton, Alta., T5J 3P4	62°51'N, 92°10'W

REFERENCES

Laporte (1974a,b, 1983b, 1985b); Tella (1986); Tella *et al.* (1986).

DIAND assessment report: 082118.

PROPERTY

JON 1 (F08252).

LOCATION

The claim is on the north shore of Rankin Inlet at Prairie Bay, approximately 5 km north of the Hamlet of Rankin Inlet (Fig. 5-1).

HISTORY

In 1928, a copper-nickel deposit on the south shore of Prairie Bay was discovered. It was mined by North Rankin Nickel Mines Ltd. from 1957 to 1962. The mine produced 9660 t of nickel and 2630 t of copper from the 368 093 t of ore.

Between 1969 and 1972, the Rankin Nickel Syndicate conducted airborne and ground geophysical surveys of the area, followed by geological mapping and diamond drilling of conductors, but failed to outline zones of economic interest (Laporte, 1974a,b).

Twenty-four claims were staked by Consolidated Five Star Resources Ltd. in late 1980 and early 1981. All but the JON claim have since lapsed.

DESCRIPTION

The area is underlain by Archean rocks of the Rankin Inlet Group, comprising greywacke with minor conglomerate, quartzite and dolomite, overlain by massive and pillowed basaltic flows. The base of the volcanic sequence is intruded by gabbro sills. Three serpentinite sills, one of which hosts the North Rankin Nickel Mines Ltd. orebody, outcrop at the base of the volcanic pile. Along the south shore of the inlet the sediments are in fault contact with quartz monzonite and are intruded by a granite pluton in the east. Metasomatic alteration accompanied the intrusion of both the granitic and mafic rocks.

Two periods of folding affected the Rankin Inlet Group rocks. First-generation recumbent isoclinal folds with northwest-trending axial planes were formed by gravitational sliding. Second-generation folds are symmetrically disposed about the axis of the granitic intrusion and have east- to southeast-trending, near vertical axial planes. Faults and some photo lineaments trend northwesterly. The lower 10 km of the Meliadine River is confined to one such fault. Glaciation has disrupted drainage patterns in the area.

CURRENT WORK AND RESULTS

In October 1986, five days were spent collecting geochemical samples. Pan concentrate samples of reworked sediments were taken along a 12 km section of the Meliadine River. The samples, from areas of active drainage, contained geochemically anomalous amounts of gold. A bedrock source for the gold was not found.

FERGUSON LAKE PROPERTY

Homestake Mineral Development	Platinum, Palladium
1000 - 700 W Pender St.	65 I/14,15
Vancouver, B.C., V6C 1G8	62°52'N, 96°51'W

REFERENCES

Bell (1971); Laporte (1984).

DIAND assessment report: 082539.

PROPERTY

KANGA 1-2 (F13470-F13471).
ROO 1-2 (F13710-F13711).
ROO 3 (F13713).
Prospecting Permits 1114, 1115 (65 I/15 NW, SW).

LOCATION

The Ferguson Lake property is approximately 224 km southwest of Baker Lake (Fig. 5-1).

HISTORY

In 1950, the Canadian Nickel Company Ltd. acquired a 1280 km² prospecting concession which covered the Ferguson Lake area. A five year program of geological and geophysical surveys outlined the Ferguson Lake deposit. The deposit consists of a Main zone of discrete and in places parallel gossanous zones up to 10 m thick. Ore is discrete pods of massive breccia-type ore with 60% to 90% pyrrhotite, or continuous stringer-type ore of chalcopyrite-pyrite-pyrrhotite stringers and veinlets. The deposit was tested along a strike length of 7.7 km and to a depth of 250 m by more than 90 000 m of diamond drilling and bulk sampling. A mineral inventory of 6 350 400 t with grades of 0.87% Cu and 0.75% Ni was delineated.

FERG 1-200 and DISC 1-8 were staked in 1955 and taken to lease in 1957. The lease for 100 of the FERG claims was renewed in 1978. In 1980 Esso Minerals Canada optioned the property and contracted Barrenlands Exploration Ltd. to extract a 9.1 t bulk sample.

DESCRIPTION

The area can be subdivided into three types of migmatite terrain based on mineralogy and weak stratigraphic correlation. Three groups of gneisses can be distinguished. The first group is characterized by layered to irregularly layered amphibole-feldspar or biotite-quartz-feldspar gneisses and associated amphibolites, hornblendites and metagabbro of metavolcanic and mafic to intermediate plutonic affinity. The second group is layered to nebulitic gneisses and migmatites of sedimentary affinity. Pink orthogneisses, gneissic granites and pink porphyroblastic granitic gneisses of granitic plutonic affinity represent the third group. Metamorphic minerals are amphibole and garnets in the first group of gneisses; cordierite and sillimanite are developed locally in the sedimentary gneisses (Bell, 1971).

Layering in the gneisses trends north to northeasterly and dips steeply. The rocks are intruded to the east by the Martell Syenite. Diabase and lamprophyre dykes cut the region.

Mafic amphibolites, the predominant rock type on the property, range in thickness from less than 100 m to approximately 1500 m. Units of hornblendite intercalated within the mafic amphibolite are scattered throughout the property and form a zone that ranges in width from 50 to 200 m and can be traced along strike for a distance of 9 km. The Main zone hornblendite hosts the Ferguson Lake deposit. The zone is sheared, as shown by local brittle failure, narrow anastomosing shears and augen-shaped amphibole clots.

The mafic assemblage is surrounded by orthogneisses and paragneisses represented by quartzo-feldspathic, granitic, pegmatoidal, biotite rich and plagioclase-biotite augen gneisses.

Syn- to post-tectonic gabbro bodies outcrop on the property. The intrusions have been amphibolitized and in places, sheared. Chlorite schist is considered to be the retrograde equivalent of sheared gabbros found nearby. A feldspathic amphibolite, possibly a leucogabbro, is in the middle of the ROO 1 claim. It is locally sheared and sulphide enriched.

Sulphide minerals are contained in gossanous amphibolites and hornblendites, iron formations, leucogabbro, diabase dykes and quartz veins.

CURRENT WORK AND RESULTS

In 1986 Homestake Mineral Development Corporation staked the KANGA and ROO claims on strike with the Inco Main zone and obtained two permits in 1987 covering the northwest and southwest quadrants of 65 I/15.

During the 1987 field season Homestake conducted reconnaissance mapping and sampling on the KANGA and ROO claims and throughout the permit areas. Permission was given by Inco for Homestake to examine the FERG group as part of the reconnaissance exploration, providing no interest was earned.

Iron-oxide-rich soil samples were collected from over the Main zone east and west of Ferguson Lake (within the FERG claims). The soils were analyzed for platinum, palladium, gold, copper, nickel, cobalt and arsenic. Average assays of 455 ppb Pt and 2.6 ppm Pd were obtained, with high assays of 3.7 ppm Pt and 15.2 ppm Pd.

Rock geochemistry analyses indicated 80 ppb to 800 ppb Pt and 20 ppb to 1250 ppb Pd from hornblendite. Massive sulphide from hornblendite-hosted gossans yielded average assays of 190 ppb Pt and 2023 ppb Pd. Average copper content is 0.48% and average nickel content is 0.72%. Concentrations of platinum and palladium in samples from Main zone breccia-type ore range from 50 to 700 ppb and greater than 5000 ppb respectively. Platinum content in the stringer-type ore ranges from 80 to 800 ppb, while palladium ranges from 90 to 1200 ppb.

During reconnaissance exploration, a number of sulphide-enriched zones were found. South of Pointed Lake, within Permit 1115, an east-trending gossanous hornblendite within amphibolite hosts discrete pods and stringers of massive sulphides and has a continuous strike length of approximately 800 m. One sample taken from the gossan yielded 2.8 ppm Pt and 760 ppb Pd. The gossan is thought to represent an offset of the Main zone.

Iron formations were found north of the ROO claims within Permit 1114. These have strike lengths of up to 500 m and contain sulphide, oxide and silicate facies. Sampling did not yield significant results.

A leucogabbro intrusion within ROO 1 contains up to 4% pyrrhotite and chalcopyrite within small scale shears.

SY PROJECT

Homestake Mineral Development	Co.Gold
1000 - 700 W Pender St.	65 I/4,5
Vancouver, B.C., V6C 1G8	62°20'N, 97°33'W

REFERENCES

Eade (1986); Laporte (1987).
DIAND assessment reports: 082335, 082541, 082834.

PROPERTY

The claims and prospecting permits are listed in Figure 5-11.

LOCATION

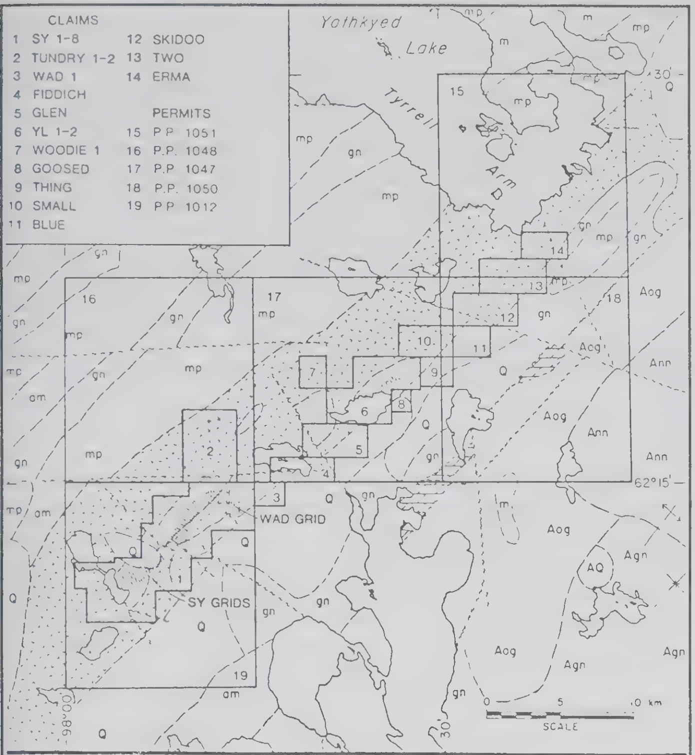
The property is approximately 870 km east of Yellowknife and 460 km north of Churchill, Manitoba (Fig. 5-1). It extends southwest from the Tyrrell Arm of Yathkyed Lake.

HISTORY

From 1969 to 1973 Prudhoe Bay Oils Ltd. held the area of 65 I/4 as Prospecting Permit 176. Columbian Northland Exploration Ltd. contracted Angus Mackenzie to carry out exploration on Prospecting Permit 176 between 1970 and 1973. In 1970, a magnetometer survey was flown and an airphoto analysis of the region was undertaken. Five zones of interest were identified. Reconnaissance mapping followed up on the survey and in 1971 further mapping, ground magnetometer surveys and trenching was carried out. In 1972, the K claims were staked to cover a magnetic anomaly corresponding to a gossan zone that contained up to 0.06% Cu. The K claims were mapped and prospected in 1973. No economic mineral concentrations were outlined during the exploration work.

Pan Ocean Oil Ltd., the predecessor of Aberford Resources Ltd., prospected for uranium during 1981. A sample was collected from an area corresponding to the SY 4 claim, that contained 3.7 ppm Au. Work in the area in 1983 and 1984 included staking two claims, mapping, prospecting, trenching, channel sampling, ground geophysics and detailed work on three zones. The best assay from the samples was 24.9 ppm Au. Prospecting Permit 1012 (NW 65 I/4) was issued in 1984.

In 1985 Abermin (formerly Aberford) acquired Prospecting Permits 1047 (SE 65 I/5), 1048 (SW 65 I/5), 1050 (SW 65 I/6) and 1051 (NW 65 I/6). The YL claims were staked in 1985.



LEGEND

APHEBIAN

AQ	Quartz monzonite, granite, in part porphyritic; minor syenite, granodiorite and quartz diorite
Aog	Orthogneiss, largely biotite quartz-monzonite gneiss with potassium feldspar porphyroblasts; cut by up to 15% dykes and stringers of quartz monzonite and granite pegmatite
Ann	Nebulitic and swirled gneiss, in part irregularly layered, predominantly biotite-bearing; contains abundant potassium feldspar porphyroblast and 20 to 25% quartz monzonite
agn	Layered to irregularly layered gneiss and agmatite, biotite and hornblende-bearing; some migmatized paragneiss; contains up to 50% dykes, stringers and irregular masses of quartz monzonite
	HURWITZ GROUP
	TAVANI FORMATION: arkose, meta-arkose, impure quartzite, mica schists
	WATTERSON FORMATION: dolomite, phyllite, argillite; and KINGA FORMATION: orthoquartzite

ARCHEAN

Q	Quartz monzonite to granodiorite, massive to slightly foliated
gn	Granodiorite gneiss, tonalite gneiss and quartz diorite gneiss; includes some orthogneiss, layered gneiss, swirled to nebulitic gneiss and amphibolite inclusions; minor quartz monzonite veins
m	Migmatite to irregularly layered, banded, or nebulitic gneiss; minor agmatite; commonly cut by dykes and sheets of quartz monzonite or pegmatite
	HENIK GROUP
mp	Migmatized paragneiss, amphibolite and granodiorite gneiss
am	Predominantly amphibolite; minor amphibolitic greenstone, amphibole schist and gneiss
	Intermediate to felsic metavolcanics; tuff, agglomerate, and flows
	Basic metavolcanics; massive or pillowed basaltic and andesite flows, pyroclastics, tuff and agglomerate;minor gabbro and intermediate to felsic flows and tuffs

FIGURE 5-11: Geology and properties, Yathkyed Lake area (geology from Eade, 1986).

DESCRIPTION

The geology of the Yathkyed-Imikula Lake area has been described by Eade (1986). The claims cover a northeast-trending belt of metavolcanics, metasediments and amphibolites of the Archean Henik Group with enclaves of intermediate and felsic tuff, agglomerate and flows and interbeds of oxide- and sulphide-facies iron formation. The iron formations are typically banded oxide facies containing finely bedded magnetite, chert, hornblende/grunerite, garnet, carbonate and sulphides. Sulphide-enriched auriferous iron formations are usually poorly exposed. Local quartz-carbonate-sericite-chlorite schist host fine-grained disseminated pyrite, pyrrhotite, chalcopyrite and up to 4% arsenopyrite. Gabbro dykes and granitoid rocks of late Archean age intrude the Henik Group. Arkoses, phyllites and quartzites of the Aphebian Hurwitz Group, are preserved in a northeast-trending graben and unconformably overlie the Archean rocks (Fig. 5-11).

Three main fault directions have been identified in the area: northeast and a conjugate set of northwest- and east-trending faults. Quartz veins occupy a prominent northeasterly trending fracture set. The veins are discontinuous along strike, up to 3 m wide and have maximum traceable lengths of 200 m. An extensive shear zone trending approximately 035°-055° along the east margin of the greenstone belt has a postulated strike length of 30 km and widths of between 50 to 100 m.

All rocks in the area are strongly deformed and metamorphosed to upper greenschist and lower amphibolite facies.

CURRENT WORK AND RESULTS

Abermin staked SY 3-8 in 1986 and Homestake Mineral Development Company optioned the SY property in the same year.

Geological mapping, lithogeochemistry, humus sampling, VLF EM and magnetic ground surveys and diamond drilling were completed on five grids and surrounding areas during 1986. Three grids were located on the SY claim group, one on the YL claim group and one grid on Prospecting Permit 1048.

Geophysical surveys over gridded portions of the SY and YL claims identified anomalies associated with iron formation. Rock, humus and pan concentrate sampling of frost boils concentrated mainly on the grids and surrounding areas.

Two types of showings were identified. The most significant is stratabound sulphide enrichment within iron formation. Of secondary importance is auriferous quartz-carbonate-sericite schist in ductile shear zones. Surface samples of auriferous iron formation were usually pyrite rich with subordinate pyrrhotite and arsenopyrite and rare chalocopyrite. An assay of 14 ppm Au came from a sulphide-enriched sample.

Auriferous schist was found on the gridded area of YL 1. The highest gold assay from a surface sample was 5.3 ppm. The schist is hosted by altered basalt and is locally enriched with acicular arsenopyrite. Higher gold content is associated with small scale quartz boudins.

During the summer, twelve holes totalling 1213.8 m tested auriferous iron formation or shear zones at depth. Five intersections grading more than 1 ppm Au over greater than two m drilled width were recovered. The highest assay was 4 ppm Au over 3.5 m core length and the widest intersection graded 3.18 ppm Au over 7 m core length.

Reconnaissance mapping during 1987 evaluated a 25 km strike length of mafic and felsic volcanics at a granodiorite and gneiss contact extending southwest from Yathkyed Lake. Geological surveys and sampling investigated 21 zones of

shearing, iron formations, quartz veining, gossans or sulphide enrichment. The highest gold assays came from quartz monzonite-hosted quartz veins. One sample assayed 7.95 ppm Au and 274 ppm Ag. Limited magnetometer and VLF surveys were done on an iron formation with poor exposure. Several lines of a magnetometer survey were completed on Yathkyed Lake and outlined a few weak anomalies. Results from the VLF survey were inconclusive.

In 1987, 21 holes totalling 2099.1 m were drilled on the SY and WAD claims to test auriferous iron formation at depth and explore a number of geochemical targets. The best intersection was 3.53 ppm Au over 3.99 m true width. The 1986 and 1987 drilling defined a 230 m bed of iron formation, open along strike, with widths ranging 3.0 to 5.0 m and gold grades of up to 5.7 ppm over 3 m.

In the fall of 1987, 13 claims were staked to complete the coverage of a 45 km strike length of the volcanic assemblage.

BAKER LAKE - THELON RIVER AREA

Rocks of the Whitehills-Tehek Lake area consist of tracts of Archean greenstone and layered amphibolite enclosed by gneissic or granitic complexes and overlain by Aphebian shallow-marine sediments. In the Baker Lake area, intermediate to felsic volcanic flows and pyroclastics and continental sediments of the Proterozoic Dubawnt Group overlie the older assemblage in structurally controlled depressions resulting from the Hudsonian Orogeny (Laporte, 1987; Urangesellschaft, 1989).

The uranium potential of the Proterozoic sequences of the Baker Lake area has attracted exploration interest since the late 1970s following the discovery of uranium in northern Saskatchewan during the late 1960s. Miller (1980) reports three uranium associations in the Baker Lake basin: northeast- and east-northeast-trending fault and fracture hosted U-Cu-Ag-Au-Se or U-Cu-Pb-Mo-Zn in the Dubawnt Group and basement gneisses; diatreme breccia containing U-Cu-Zn in basement gneisses; and U-Cu-Ag impregnations and fracture fillings in altered arkose peripheral to lamprophyre dykes.

In 1986-87 exploration targets were divided between Kiggavik-type unconformity-related uranium in the area south of Baker Lake and gold in the Archean rocks of the Parker Lake and Tehek Lake areas.

PARKER LAKE PROJECT

Comaplex Minerals Corp	Gold
910 - 1015 4th Ave. SW	55 M/9,10
Calgary, Alta., T4R 1J4	63°33'N, 94°37'W

REFERENCES

Reinhardt (1980); GSC Open File 417 (1976).
DIAND assessment reports: 082145, 082529, 082560.

PROPERTY

Prospecting Permit 1108 (55 M/9 SE).
Prospecting Permit 1109 (55 M/10 SW).
Prospecting Permit 1112 (55 M/10 SE).

LOCATION

Prospecting Permits 1109 and 1112 are contiguous and are immediately north of MacQuoid Lake. Prospecting Permit 1108 is northeast of MacQuoid Lake (Fig. 5-12). The property is approximately 110 km southeast of the town of Baker Lake.

HISTORY

The area was mapped in 1954 by Wright (1967) and again in the early 1970s by Reinhardt (1980) who delineated an extensive gossan zone within the area of Prospecting Permit 1108. In 1976 the GSC conducted a regional lake bottom sediment study in the area of NTS 55 M. Sediments were analyzed for 12 elements. Two samples from the area of Prospecting Permit 1108 yielded between 2-5% As.

A number of companies were active during the 1970s, examining the uranium potential of the area north and west of the permits. L. Curtis staked RS 1-3 in 1985, but the claims were never recorded. Comaplex workers found evidence of sampling along the gossan in Prospecting Permit 1108.

DESCRIPTION

The permits straddle the contact between an enclave of hornblende-rich rocks of mafic volcanic and possibly intrusive origin and an extensive area of granite and gneiss terrain (Wright, 1967). The greenstones consist of amphibolite-grade mafic metavolcanic rocks, mafic intrusions and intercalated metasediments. Mafic metavolcanic rocks form flows, pillowed flows or tuffs. Garnets are locally abundant, developed preferentially along smaller pillow selvedges.

Sedimentary and mafic volcanic units host iron formation. Within sediments, iron formation varies from magnetite-quartz banded, to a unit with remnant magnetite-quartz layering replaced by pyrrhotite-magnetite-quartz, with secondary oxides and local pyrite, actinolite and garnet. In the east (Prospecting Permit 1109), iron formations are related to shearing and structural deformation.

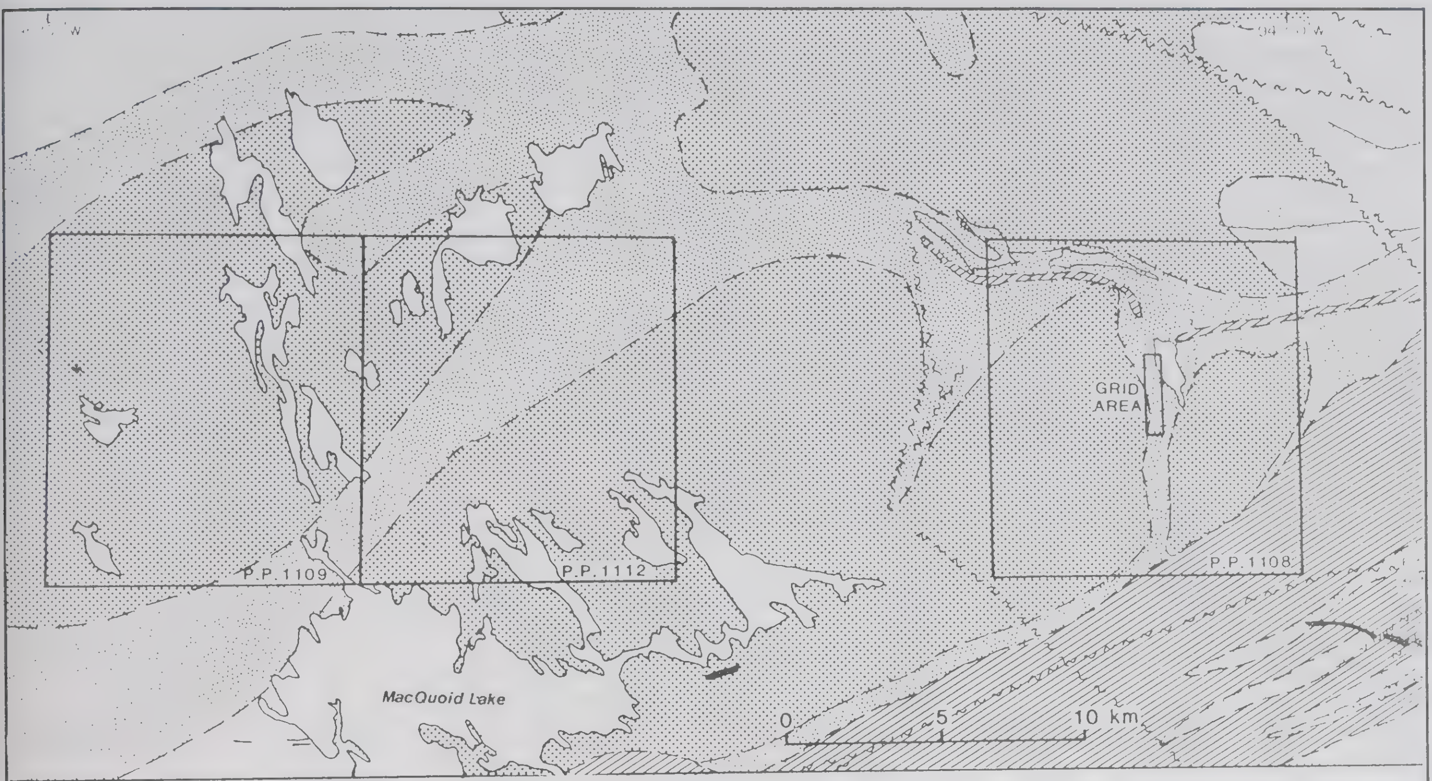
Quartzite, resembling Hurwitz Group quartzite, at the contact of a prominent gossan zone, strikes east to southeast in the northwest portion of Prospecting Permit 1108. Meta-arkose is in a south-trending belt of mafic volcanics in the central part of Prospecting Permit 1108, in an east-striking belt of sediments in the northern part of the permit and in a northeast-striking belt of volcanics and sediments in Prospecting Permits 1109 and 1112.

The entire assemblage (with the exception of a few younger granitic plugs) is well foliated and trends northeasterly. Supracrustal rocks are metamorphosed to amphibolite grade.

CURRENT WORK AND RESULTS

In 1986, Comaplex Resources Inc. acquired Prospecting Permits 1108 and 1109. Prospecting Permit 1112 was issued in the following year.

During 1986, reconnaissance geological mapping, prospecting and rock sampling was performed over Prospecting Permits 1108 and 1109, as well as east of Prospecting Permit 1109. Three favourable environments for gold were identified: sulphide-facies iron formation; west-northwest- to north-northwest-trending shear zones or structural deformation zones hosting quartz and dolomite veining; and rusty or silica-rich zones, at or near lithological contacts. These environments yielded high gold concentrations of up to 23.6 ppm for quartz vein samples and 8.3 ppm from a shear zone within amphibolite. Seven of twelve samples taken from an extensive iron formation, 3.5 km in length and 6 to 20 m in width, were anomalous in gold. The highest gold assay was 2.6 ppm. The iron formation contains arsenopyrite, with minor pyrite and pyrrhotite, locally admixed with chlorite and sericite in a siliceous matrix. Of the 66 rock samples collected from all environments, 27 were anomalous in gold.



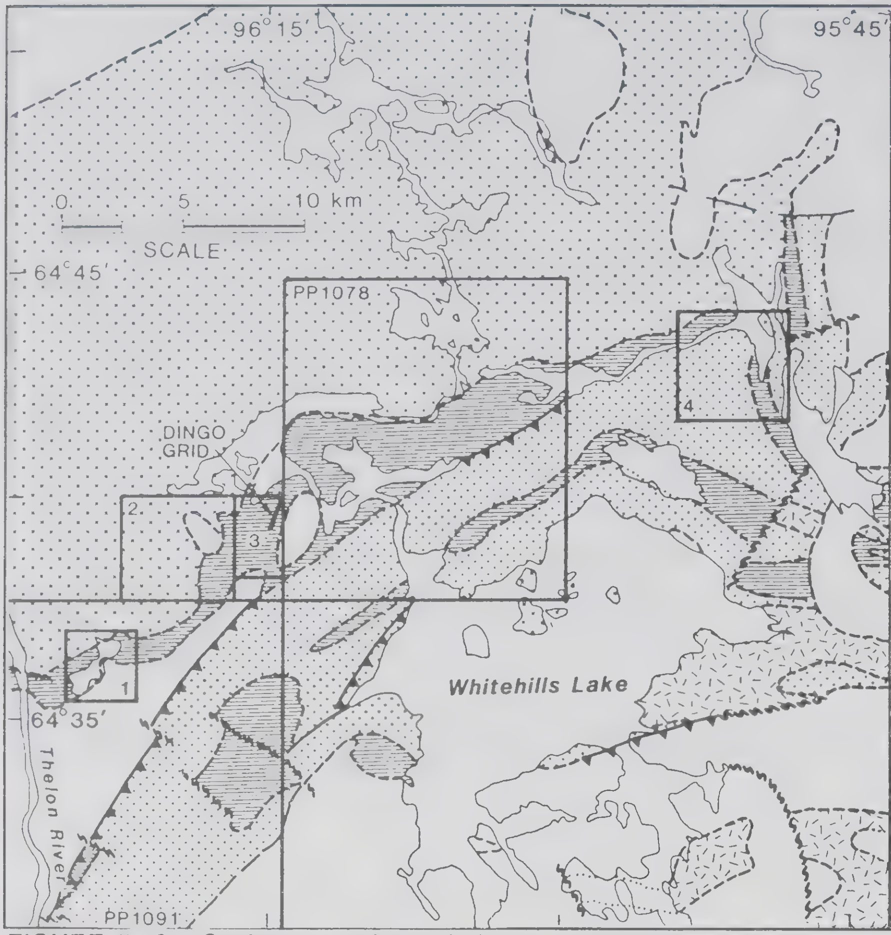
LEGEND

- Diabase
- Migmatites
- Quartz monzonite, granite, granodiorite, quartz diorite
- Paragneiss, layered rocks of mainly sedimentary origin, can include iron formation
- Hornblende-biotite gneiss, quartzofeldspathic gneiss
- Amphibolite, includes metavolcanic rocks, mafic intrusive rocks and intercalated metasediments, pillow structure locally
- ~~~~ Shears, Faults

FIGURE 5-12: *Geology of the Parker Lake-McQuoid Lake project area (after Laporte, 1985b).*

In 1987 a 25.5 km grid, with 100 m line spacing, was established over the auriferous iron formation. The grid was used as control for detailed geological mapping and channel sampling. A total of 60 samples, including eleven channel samples, were collected from the grid area. Forty-six samples were anomalous in gold and 16 ranged from greater than 500 ppb to 44.4 ppm Au. White vuggy quartz veins; sheared, chloritized contacts with meta-basalt and strongly gossanized zones within the iron formation were associated with elevated gold content.

Reconnaissance mapping, sampling and prospecting was done outside the gridded area on Prospecting Permit 1108 and throughout the entire area of Prospecting Permit 1112. Assays of up to 16 ppm Au were obtained from iron formation on Prospecting Permit 1112. Four gold showings were discovered on Prospecting Permit 1108. The highest assay from a gossan sample bearing abundant pyrite and pyrrhotite was 21.4 ppm Au. Three samples taken from a quartz-veined shear zone, 0.1 to 23 m wide, with a strike length of 1 km, assayed between 1.8 and 7.4 ppm Au. Amphibolite samples collected near a granite contact yielded 1.9 to 23.8 ppm Au and up to 0.23% Cu, 10.6% Zn, 5.3% Pb and 1060 ppm Ag. The zone contains chalcopyrite, sphalerite, galena, pyrite and trace pyrrhotite in silicified dolomotized shear zones. A sample of rusty silicified zone within basalt, hosting veins and lenses of arsenopyrite, pyrite and pyrrhotite, assayed 4 ppm Au. The highest base metal concentrations were obtained from a gabbro dyke, which yielded 1.04% Cu, 810 ppm Ni, 15.8 ppm Ag and 688 ppb Au.



KEY TO CLAIMS IN FIGURES 5-13 & 5-14

BAKER LAKE PROJECT

1	MCLEOD
2	ALLEN 1 & 2
3	OLIVIA
4	JEAN 1 & 2
5	MO
6	SH
7	ER
8	CAREY
9	DICK
10	DEVIN
11	CHRIS
12	MAUD
13	WEBSTER
14	HAZEL
15	MUFFIN
16	HAS
17	MOON 1-2
18	SON
19	SELL 1 & 2
20	DONNA
21	AND
22	REA
23	LETISHA 1 & 3
24	NI 1 & 2
25	LA
26	LEI

FIGURE 5-13: Geology, permits and claims of the Whitehills Lake area (after Laporte, 1985b).

LEGEND FOR FIGURES 5-13 & 5-14 -- BAKER LAKE PROJECT

LEGEND

Undifferentiated Aphebian and Archean Intrusives

WOODBURN LAKE GROUP

White orthoquartzite, quartz-mica schist

Greywacke, chlorite schist, minor laminated chert and carbonate

Ultramafic rocks, basaltic and peridotitic komatiites, spinifex textured flows, minor felsic metavolcanics and layered volcanic rocks

Felsic to intermediate tuffs, flows and shallow intrusive rocks, rhyolite porphyry

KETYET RIVER GROUP

Slate, shale, phyllite, metasiltstone and biotite schist

Mafic volcanic flows, breccias and intrusions, volcanogenic sediments

SYMBOLS

Geological Contact
Fault
Thrust Fault

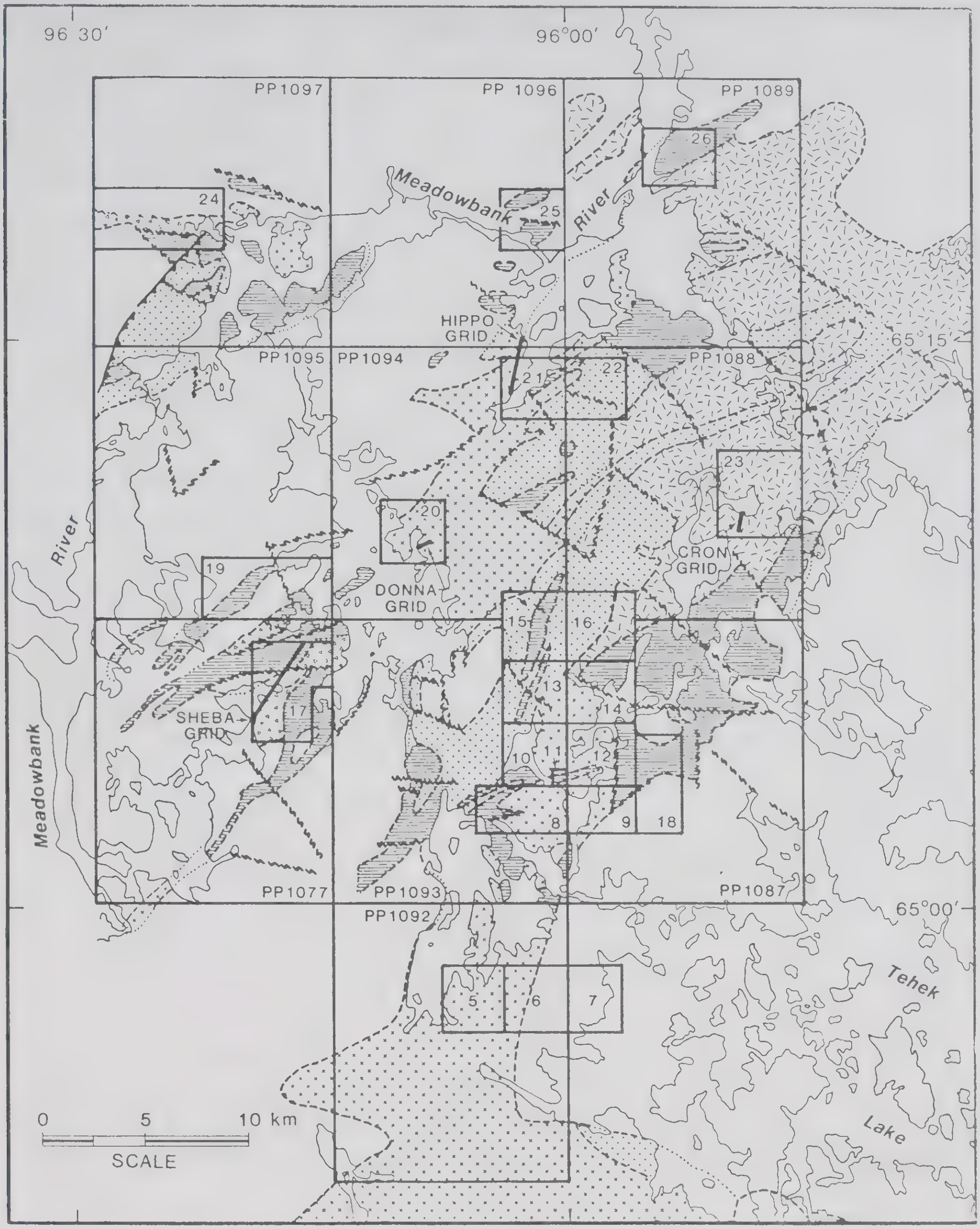


FIGURE 5-14: Geology, permits and claims of the Tehek Lake area (after Laporte, 1985b).

BAKER LAKE PROJECT

Comaplex Resources Corp.
901, 105 4th St. SW
Calgary, Alta., T2R 1J4

Gold
56 E; 66 A,H
63°00'-65°45'N
96°45'-97°30'W

REFERENCES

Ashton (1982); Laporte (1983b, 1987); Wright (1967).
DIAND assessment reports: 060660, 081100, 082101, 082136, 082535, 082688.

PROPERTY

The prospecting permits and claims are listed on Figures 5-13 and 5-14.

LOCATION

The property is approximately 115 km north of the town of Baker Lake. The claims and permits cover three separate areas; immediately north-northwest of Tehek Lake, immediately northwest of Whitehills Lake, and the MOON claims are approximately 35 km south of Schultz Lake (Figs. 5-13, 5-14, 5-15).

HISTORY

Past attention by companies, including Urangesellschaft, Metallgesellschaft, Aquitaine and Central Del Rio Oils Ltd., has been devoted to the uranium potential of the Baker Lake Project area. During uranium exploration by Essex Minerals in

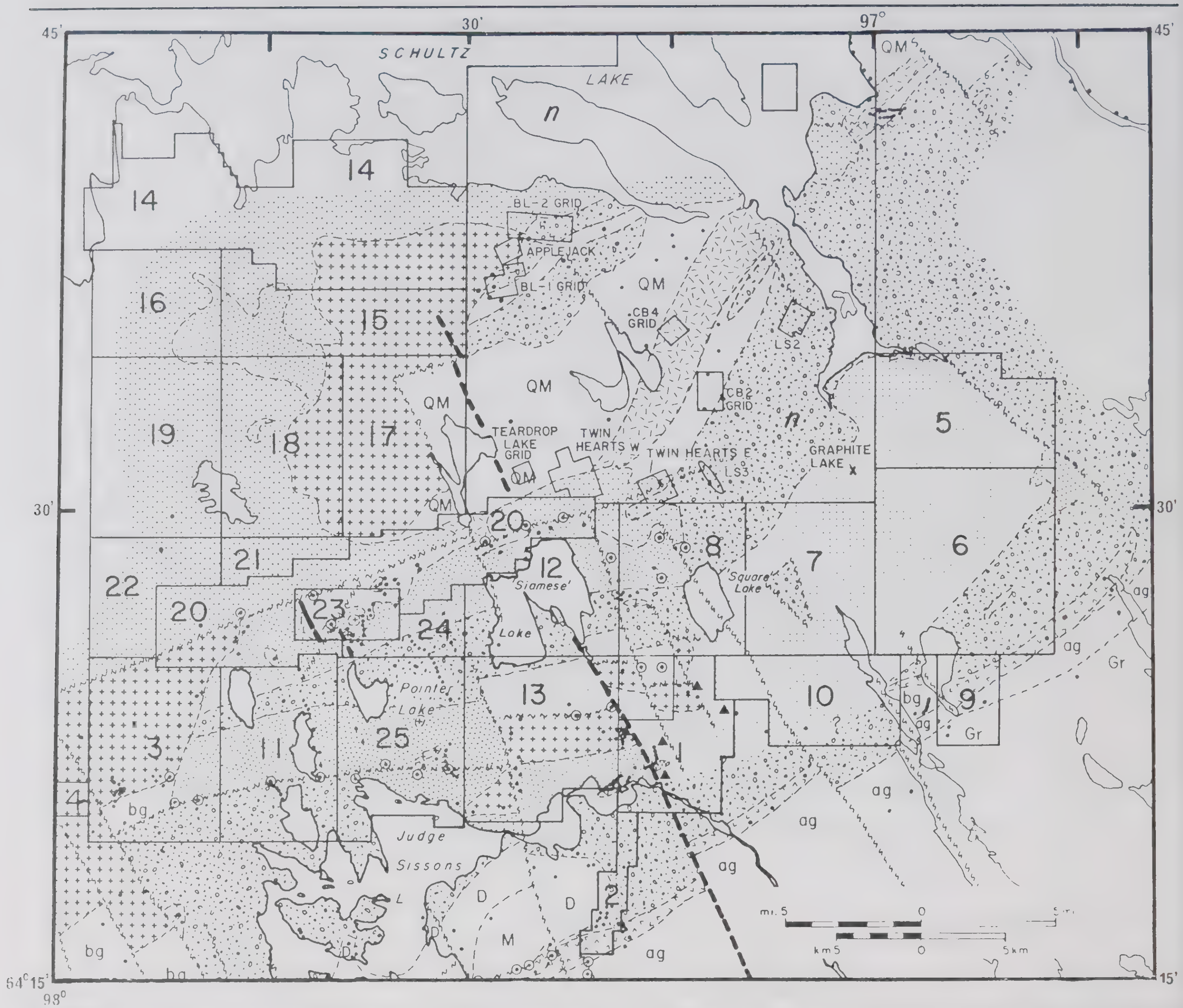


FIGURE 5-15: Geology and properties, Schultz Lake and Judge Sissons Lake areas (geology mapped and compiled by P.J. Laporte).

1979, an iron-rich gossan, 61 m in strike length, was discovered in an area corresponding to the current SELL claims. Fuchsite was noted in the area. A VLF conductor supports the interpretation of a 3.2 km strike length to the gossan. Soil samples collected over metavolcanics contained 1 ppb to 25 ppb Au.

From 1969 to 1972 the area west of Whitehills was held by Ensign Oil Ltd. and Fort Reliance Minerals Ltd. as Prospecting Permit 93. The north part of the Whitehills area was held by Hudson's Bay Oil and Gas Company Ltd. between 1981 and 1983 as Prospecting Permits 753 and 754. Both companies conducted airborne and ground geophysical and geological surveys. Ensign Oil and Fort Reliance Minerals outlined 29 conductors in the area. In 1969, Surveymin Ltd. performed work on Prospecting Permit 93. Iron formation was found and the highest assays from three samples taken approximately 8 km west of Whitehills Lake were 6.0% Pb, 1.9% Zn, 0.09% Cu, 0.1% Ni, 4.1 ppm Au and 17 ppm Ag.

The Phoenix prospect was staked by Comaplex in 1979 to cover a conductor outlined during a 1969 airborne survey. An agreement between Comaplex and a joint venture partner failed to be formalized and the claims lapsed. Between 1983 and 1986, the area of interest expanded and Comaplex acquired prospecting permits and claims covering the areas outlined in Figures 5-13 and 5-14 and the Phoenix prospect was restaked as MOON 2 to 6. Work in the project area in 1983 and 1984 identified four showings on Prospecting Permit 1077 and one west of Whitehills Lake. The most significant was the Sheba showing, on Prospecting Permit 1077, now covered by MOON 1, where average assays of 7.36 ppm Au were obtained from 75 samples of quartz-veined quartz-eye porphyry (Laporte, 1987).

LEGEND for Figure 5-15

HELIKIAN

Diabase dykes

DUBAWNT GROUP

Thelon Formation: conglomerate and sandstone

Quartz-hematite breccia

APHEBIAN

Fluorite-bearing granite, syenite

ARCHEAN(?)

M	Monzonite
D	Diorite
ag	Augen gneiss
Gr	Quartz diorite to granodiorite
bg	Biotite gneiss (derived from sediments)
a	Amphibolite (derived from mafic volcanics and dykes)

Felsic flows and tuffs

Orthoquartzite, laminated, sericitic and pyritic quartzite, quartz phyllite.

'Dirty quartzites': arkosic to lithic arenites, biotite and/or almandine gneiss, quartz arenite, mica schist

Dolomitic carbonate rock

Greywacke, lithic greywacke, arkosic wacke, subgreywacke (include some 'dirty' quartzites)

Massive to pillowed mafic volcanics

● data/sample collection point (P.J. Laporte)

▲ Zones of mineralization on SAM claims

GIANT YELLOWKNIFE MINES

1: SAM 1-5

COMAPLEX

2: MOON 1-6

URANGESELLSCHAFT

3:	BILA 1-8	14:	IT 1-591; KF 8-9[1] 78 SCH[1]:
4:	BS 5		
5:	COO 1-8[1]	15:	AJOL 1-8[1]
6:	LA 1-12[1]	16:	WUNZ 1-6
7:	DOVA 108	17:	MAN 1-8
8:	SHAY 1-8[1]	18:	WAG 1-8
9:	LAST 7, 8	19:	LYS 1-8
10:	LAST 2-5; TREE 4	21:	PED 1-4
11:	BONG 1-8	22:	CAM 1-6
12:	OTHA 1-8	24:	BYA 3-6
13:	BAR 1-10	25:	UND 1-8[1]

Lone Gull Deposit

20:	L 1-620	23:	SSL 1-128

PNC EXPLORATION - n: F 5-13

[1] partly lapsed from 1984 - 1987

DESCRIPTION

The Baker Lake Project area is underlain by a broad, northeasterly trending supracrustal belt (Fig. 5-13), separated at the west end of Tehek Lake by intervening gneissic terrain (Laporte, 1985b; Wright, 1967).

The supracrustal rocks, mapped as the Woodburn Lake group, can be subdivided into two main groups consisting of volcanics with associated sediments and quartzites (Ashton, 1982). Felsic to intermediate flows, tuffs and rhyolite porphyry; mafic volcanic flows, breccias and intrusions with volcaniclastic sediments grade into basaltic and peridotitic komatiites with spinifex textured flows. The volcanic rocks are overlain by slates, shales and greywackes and their metamorphosed equivalents (Laporte, 1985b).

The relationship of the quartzite to the volcanics and sediments is not understood. The quartzite could be tectonically emplaced and thus older or younger than the volcanics and sediments (Laporte, 1987). Contacts between the quartzites and metavolcanics are represented by chlorite schists that suggest the presence of low angle faults, but quartzite pebbles are found in sediments overlying, and grading into, the volcanic sequence which would indicate that the quartzites predate the volcanics (Ashton, 1982).

Oxide- and sulphide-facies iron formation are hosted by the sediments, proximal to the volcanics (Laporte, 1987). Sulphide and carbonate facies have been recognized by Asamera workers (DIAND assessment report 082688). In the Whitehills Lake area, layers of iron formation extend from the Thelon River to the northeast shore of the lake (Laporte, 1985b). Iron formation is also abundant northwest of Tehek Lake (Ashton, 1982).

The supracrustals and derived gneisses have been intruded by Archean granodiorites, gabbros and peridotites and Aphebian granites and syenites. In the Whitehills Lake area, a northeasterly trending supracrustal belt is locally bounded by thrust faulting and warped by the intrusion of the Tehek Lake Plutonic complex into a south-trending antiform (Fig. 5-14). Between Tehek Lake and Meadowbank River, the supracrustals are approximately northeasterly trending, but are disrupted by numerous fault sets trending northwesterly and easterly (Laporte, 1985b).

In 1985, sampling by Laporte (1985b) defined seven distinct areas that yielded anomalous gold results, six of which are covered by claims and permits of the Baker Lake Project.

CURRENT WORK AND RESULTS

In 1986, exploration included reconnaissance mapping and prospecting. Seven grids were established with an aggregate total of 22.7 km baselines and 156.4 km winglines. Grid details are summarized in Table 5-2 and locations are indicated on Figures 5-13 and 5-14. Detailed mapping, geochemical sampling and geophysical surveys were conducted on the grids. A total of 2642 m of diamond drilling was carried out on two gold showings.

In 1986, reconnaissance mapping and sampling was carried out over 12 prospecting permits. Gold-bearing samples, from the 729 samples collected, cluster into two roughly parallel broad belts approximately 22 km in length, partially separated by a portion of the Tehek Lake intrusive complex. The more northerly belt contains the Sheba, Jan, Tanzin, Donna and Hippo showings and the southerly belt contains the Horace, TR, Wally World, Long Root and Ron showings (Fig. 5-13). The Calvin base metals showing is north of the belts on the NI claims.

In 1986 ground geophysical surveys were conducted on the Sheba, Phoenix, Ron and Dingo grids by Geoterrex Ltd. Survey types are summarized in Table 5-3. The surveys were unsuccessful in locating significant anomalies on the Sheba grid. Strong VLF conductors detected on the Phoenix grid correlated with an airborne EM conductor. Some magnetic features were delineated on the Dingo grid, but did not help define the granite contact. Strong anomalies on the Ron grid had not yet been correlated to surface showings.

Detailed grids covered the main Sheba showing, as well as the Jan, Stoney and Tazin showings. The main Sheba zone consists of quartz-sericite schists within a sequence of rhyolites that host gossans containing base metals and gold. The zones have a geochemical expression, but no geophysical expression. In 1986, a total of 1776 m of diamond drilling in 15 holes tested three zones of en-echelon shears and a geochemical anomaly. Narrow multiple intersections were recovered with a best intersection of 133 ppm Au over 0.2 m.

TABLE 5-2: GRID DETAILS, BAKER LAKE PROJECT (DIAND assessment report 082136)

GRID	BASELINE ORIENTATION	GRID SIZE	SPACING (m) line/station
Sheba Regional	038°	66.6	100/25
Sheba Detail	038°	9.85	25/25
Phoenix	017°	57.4	100+200/25
Ron	010°	9.3	50/25
Dingo	028°	19.6	100/25
Wally World	025°	4.51	irregular/25
Donna	059°	3.95	100/25
Hippo	010°	7.93	irregular/50

TABLE 5-3: SURVEY COVERAGE BY GRID AND METHOD (DIAND assessment report 082101)

	PROPERTY			
SURVEY	Sheba	Phoenix	Dingo	Ron
MAG	64.6 km	67 km	19.9 km	6.0 km
VLF	65.6 km	58.9 km*	-	8.5 km
GRAD	54.35 km	5.65 km	-	-

The Sheba North showing, quartz-carbonate veinlets and zones of sericite schist within interlayered volcaniclastics and felsic tuffs, was tested in 1986 by 217 m of diamond drilling in three holes. Thin patchy sulphides were recovered with one anomalous gold assay of 1.1 ppm Au.

Exploration on the Phoenix showing was designed to test an airborne geophysical anomaly. Quartz-sericite schists and chloritic schists with up to 3% pyrite were sampled, but failed to yield economic gold concentrations. Similar schists to the north of the property (the SAM claims) contain up to 10% sulphides and 19 ppm Au.

In 1987, a Landsat study, an airborne multisensor survey, regional prospecting and further evaluation of gold showings discovered during 1986 was undertaken.

In 1987, 44.5 km of Max-Min was conducted on the Phoenix grid to define the axis, depth, width and dip of an EM conductor that does not outcrop. The conductor was drill tested for a strike length of 8 km by 1992 m of drilling in 19 holes. Nine hundred and twenty-four core samples averaging 1 m in length were analyzed for gold and silver, but did contain economic grades.

On the Dingo grid, a 6 m wide auriferous quartz vein, at the contact between a granodiorite stock and gabbro-peridotite ring dyke, was evaluated. A sample of chalcopyrite- and bismuthinite-bearing quartz assayed 3 ppm Au.

The showing on the Ron grid is a zone of gold- and arsenopyrite-bearing quartz veins within felsenmeer. A series of veins were outlined over an area 160 m long by 50 m wide. Assays of up to 33 ppm Au were yielded by quartz samples. The zone was drill tested by 475 m in four holes. Low grades across narrow widths were intersected.

The Hippo grid was established to follow up on gold-bearing grab samples. Two zones of narrow auriferous quartz veins were discovered. One zone, a pyrite- and arsenopyrite-bearing gossan with up to 10 ppm Au, coincides with VLF and geochemical anomalies. The second zone produced an assay of 72 ppm from a quartzite-hosted argillic, quartz-veined interbed with apparent widths of 10 to 20 cm.

A series of sulphide lenses, veins and extensive pyrite- and pyrrhotite-bearing gossans in alternating rhyolite and ultramafic flows underlying the Donna grid were sampled during 1986 and assayed up to 5 ppm Au. In 1987, grab and channel sampling failed to return significant results.

The Wally World Trend was delineated and examined during 1986 and 1987 field work. Twenty-nine gold showings were found along a northeast-striking belt of intermediate to mafic tuffs with intercalated iron formations and metasediments. A structural break was interpreted in the centre of the trend that hosts almost half of the showings (Fig. 5-16), although no correlation between faulting and gold content was observed. A grid was established in 1986 to cover an area of gold-bearing grab samples. Grid surveys detected a number of showings over a discontinuous strike length of 10 km. The showings were examined in more detail during the 1987 field season. The Long Root, Wally World and Cricket showings are quartz-carbonate veins. Trenching and channel sampling on the Long Root and Wally World showings failed to reveal a bedrock source for the gold. A channel sample collected at the Cricket Occurrence assayed 2.6 ppm Au over 1.2 m. The TR1 and Tern Lake Occurrences are discontinuous pods of quartz and a quartz vein up to 50 cm wide respectively.

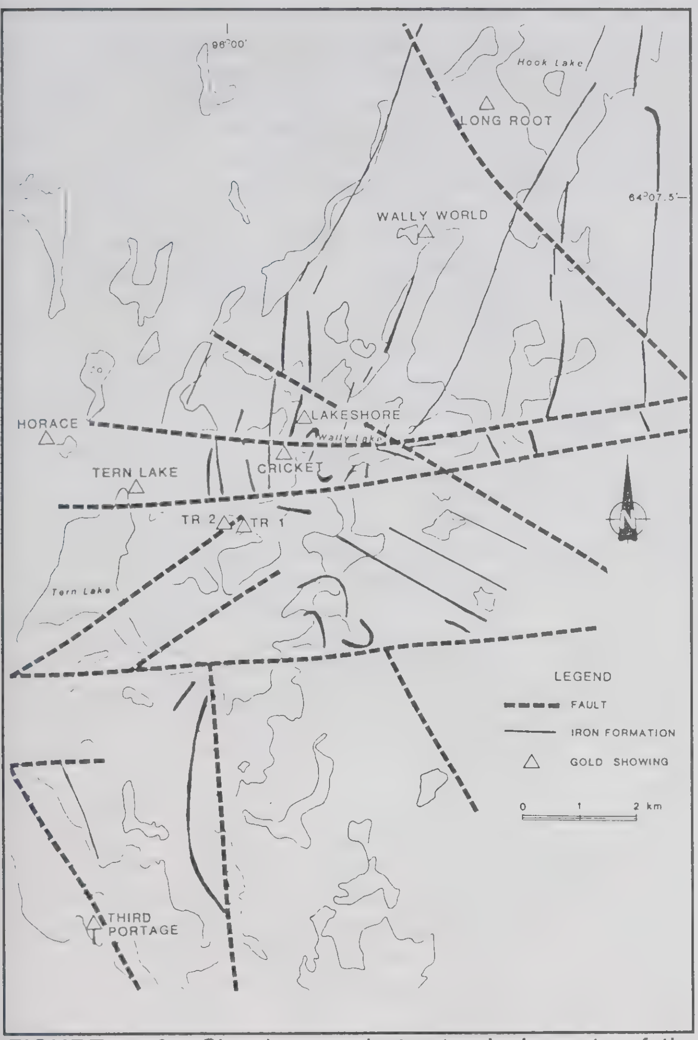


FIGURE 5-16: Showings and structural elements of the Wally World Trend (from DIAND assessment report 082688).

Samples from the Tern Lake Occurrence assayed up to 148 ppm Au and 1061 ppm Ag. Sulphidic samples of oxide-facies iron formation from the Third Portage Lake Occurrence (discovered late in the 1987 field season) contained anomalous amounts of gold in 6 of the 17 grab samples taken. The highest assay for the Third Portage Lake Occurrence was 19.6 ppm Au.

Three types of showings at the TR2 Occurrence are spatially related to a quartz-feldspar porphyry contact. The three types are: pyritic siliceous bands in micaceous argillite; siliceous bands within quartz-feldspar porphyry; and deformed oxide-facies iron formation surrounded by quartz-feldspar porphyry. Assays of up to 81.4 ppm Au were obtained from the first type.

The Calvin East showing was found late in the 1986 field season. Samples taken at the time from a base metal-bearing quartz vein contained up to 7.4 ppm Au. Channel sampling and trenching in 1987 failed to reproduce the 1986 results.

Four of the seventeen samples taken from the Horace showing during the 1986 field season assayed greater than 1 ppm Au, with a high assay of 3.8 ppm Au. Gold was hosted by sheared siliceous sericitic quartzite, containing up to 5% combined galena and chalcopyrite. The showing was evaluated in 1987 by gridding, mapping, channel sampling and VLF surveys, which failed to yield significant results.

SCHULTZ LAKE PROJECT

PNC Exploration Co. Ltd	Uranium
2401 - 650 W Georgia	65 A/11
Vancouver, B.C., V6V 4N8	64°42'N, 97°15'W

REFERENCES

Laporte (1983b, 1984, 1987).
DIAND assessment reports: 082359, 082507.

PROPERTY

F 5-13 (F01462-F01470).
F 15-50 (F01472-F01507).
F 51-59 (F07678-F07686).
F 60-68 (F01285-F01293).
F 69-77 (F09970-F09977).

LOCATION

The claims are south of Schultz Lake (Fig. 5-15).

HISTORY

In 1969 and 1970 Aquitane flew radiometric and magnetometer surveys revealing two anomalous areas on the east central portion of 66 A/11 (Prospecting Permit 163). In 1970, an airborne EM and magnetometer survey outlined three EM conductors on Prospecting Permit 163, but no further work was done and the permits were relinquished.

In 1978 BP minerals acquired Prospecting Permits 533-536. Airborne radiometric, VLF EM and magnetic surveys covered 2045 line-km with 320 m line spacing (Laporte, 1983a). Lake sediment and soil sampling, mapping and prospecting in 1979, delineated three showings. One was an outcrop of radioactive Thelon Formation conglomerate containing 185 ppm U_3O_8, that is now covered by the Twin Hearts grid. Another was quartz pebble conglomerate in Aphebian sediments (Graphite Lake) and the third showing, now known as the Boni Lake Boulder Train, is 1.5 by 0.5 km, comprising 100 boulders of radioactive meta-arkose with up to 0.52% U_3O_8. Grids were established over the showings and geological, geochemical, VLF EM and radiometric surveys were conducted (Laporte, 1983b).

In 1980, 2735 line-km of INPUT and magnetometer surveys was flown at 200 m line spacing. The surveys delineated strong conductors in the Graphite Lake and Twin Hearts areas (Fig. 5-15). The Boot Lake grid was established and subsequent geological and geophysical surveys defined uranium soil anomalies (DIAND assessment report 082507).

From 1980 to 1981, 3091 m in 31 holes was drilled to test radioactive conglomerate in the area of VLF EM, INPUT and Max-Min conductors. Radioactivity encountered in the core was related to thorium-rich dykes and phosphate-rich Thelon Formation sandstone (Laporte, 1984).

In 1981, the permits were converted to claims and the property lay idle from 1982 until 1986 when PNC Exploration, in joint venture with BP, became the operator for the project.

GEOLOGY

The property is underlain by a northeasterly trending belt of supracrustal rocks. Archean sediments and metasediments are in fault contact (DIAND assessment report 082507) with quartz monzonite that occupies a belt in the central portion of the

property. Pyrite + chlorite ± fluorite ± uranium line fractures in the monzonite and in meta-arkose near the contact. The Archean rocks are intruded by Aphebian fluorite-bearing syenite and granite at the west central boundary of the property. Thelon Formation conglomerate and sandstone of the Dubawnt Group unconformably overlie the Archean rocks (Laporte, 1987).

CURRENT WORK AND RESULTS

The objective of the regional work in 1986 was to identify Kiggavik-type deposits. Early in the 1986 season, a DIGHEM multi-sensor survey was flown over the property covering 1000 line-km at 250 m spacing. A number of resistivity lows were detected, including a major low, 1 km south of the "Applejack" boulder train showing delineated by BP (Fig. 5-15). An additional 252 line-km at 250 m spacing was surveyed during 1987. A number of resistivity lows related to easterly trending VLF anomalies were detected.

A total of 161 lake sediment samples were collected, completing the lake sediments surveys of the property started in 1979. Three anomalous zones were found, one extending west from Graphite Lake, one between Graphite Lake and the Central belts and a third in the area of Twin Heart Lakes (Fig. 5-15). In 1987, pulps from the 1979 and 1986 sampling were submitted for multi-element (30) analysis. Nine anomalies were outlined.

Three areas with poorly defined resistivity lows and lake sediment anomalies were targeted for follow-up work (Fig. 5-15). 16.8 km of scintillometer, mapping and soil surveys was completed on the LS2 grid. Control lines were established on the Applejack boulder train for prospecting and LS3 grid was examined during one traverse. Two radioactive boulders found in the Applejack area assayed 2200 and 3600 ppm U. On the LS2 grid uranium-in-soil anomalies are associated with copper-in-soil anomalies.

Regional mapping and sampling, with concurrent scintillometer surveys, tested areas considered to be geologically similar to the Kiggavik deposit: The Boot Lake grid, the Central grid and the Graphite grid. Based on the work, the following table of formations was proposed.

Drill core from 1980-81 drilling on the Twin Hearts grid was re-examined in 1986 to further define the geology and structure of the area.

In 1986 the 7.2 km "Uno grid" (in the area of the BL1 grid) with 200 m line spacing and 50 m station intervals was established over the area of low resistivity defined by the airborne survey (Fig. 5-15). Ground EM, magnetic and scintillometer surveys attempted to pinpoint the area of low resistivity. There is good correlation between the anomalies defined by airborne surveys and by ground surveys.

During 1987, a series of grids with 100 m line spacing and 50 m station intervals were established. VLF, EM-16R, magnetometer, gravity, Max-Min and "C" horizon soil sampling with concurrent scintillometer surveys were conducted on the BL1, BL2, Twin Hearts East, Twin Hearts West, CB2, CB4 and Teardrop grids. Nine zones were outlined and prioritized.

Two zones were considered of primary importance. On BL1, several soil anomalies with concentrations of up to 19.7 ppm U were outlined and a linear zone, 1800 by 500 m, of low resistivity, magnetic contrast and gravity was defined. A gravity and resistivity low and weak EM conductor was outlined on the Twin Hearts East grid. The zone is hematized greywacke close to an unconformity between Thelon Formation and basement rocks.

TABLE 5-4: TABLE OF FORMATIONS, SCHULTZ LAKE AREA

NEOHELIKIAN

Diabase & Gabbro

HELIKIAN

Thelon Formation
- siltstone
- sandstone
- conglomerate

-----------Unconformity----------

APHEBIAN

Dubawnt Group
- Christopher Island Syenite Dykes

Fluorite-bearing Granite and Quartz Monzonite
- Massive Granite
- Porphyry

APHEBIAN?ARCHEAN?

Felsic and Intermediate Volcanics
- quartz latite
- rhyolite
- dacite
- andesite

Graphite Chlorite Schist

Quartzite
- orthoquartzite
- sericite orthoquartzite
- impure quartzite

Clastic Metasediments
- arkose
- quartz biotite schist
- amphibolite
- greywacke

ARCHEAN

Foliated Quartz Monzonite

SAM CLAIMS

E.A. Gallo	Gold
148 Allanhurst Dr.	66 A/6
Islington, Ont., M9A 4K7	64°22.5'N, 97°15'W

REFERENCES

DIAND assessment reports: 082633, 061352, 081070, 081356.

PROPERTY

SAM 1-5 (F12293-F12297).

LOCATION

The property is 8 km east-northeast of Judge Sissons Lake, approximately 60 km west of the town of Baker Lake (Fig. 5-15).

HISTORY

In 1969, Central Del Rio Oils Ltd. contracted Questor to fly an airborne geophysical survey. A magnetic anomaly was delineated, trending northeast from Judge Sissons Lake, that was later related to an iron formation. Two north-northeast-trending INPUT anomalies were detected near the southwest corner of the SAM claims.

Metallgesellshaft held the area of the SAM claims in the early 1970s under Prospecting Permit 319 and found an iron formation layer hosting disseminated chalcopyrite immediately north of Judge Sissons Lake.

During 1980 exploration south of Judge Sissons Lake, Comaplex sampled two sulphide-bearing boulders that yielded 4.1 ppm Au and 109 ppm Ag. During the same field season, Cominco workers found beds of iron formation on an island in Judge Sissons Lake and on the eastern shoreline of the lake. Oxide, sulphide and silicate facies 2 m wide was traced for a strike length of 400 m.

In 1981, Urangesellschaft flew VLF EM and magnetometer surveys over the area of the SAM claims and delineated several northwest-trending VLF EM conductors.

The SAM claims were staked in 1986 to cover the areas where samples, collected by S. Surmacz in 1985, assayed up to 159 ppm Au. In 1987, the claims were optioned to Pamorex Minerals Inc. who carried out the exploration described in this section.

DESCRIPTION

The claims are at the south edge of the belt of supracrustal rocks trending from Judge Sissons Lake to Tehek Lake. The Archean rocks are mafic to intermediate tuffs, now represented in places by chlorite schists and metasediments ranging from graphitic slates to greywackes and quartzites. The rocks are overlain by Aphebian metasediments and intruded by a northwest-trending swarm of Hadrynian diabase dykes.

CURRENT WORK AND RESULTS

Regional geological mapping at 1:10 000 identified five zones of interest. In the Big Sam North and the Intrusive Shear zones, gold is associated with polymetallic quartz veins. At the Big Sam North zone, the vein system hosts galena, sphalerite and chalcopyrite. Grab samples assayed up to 1.7 ppm Au. Quartz veins in the Intrusive Shear zone contain arsenopyrite, pyrite, sphalerite and galena. Maximum assays were 119 ppm Au, 100 ppm Ag, 2.1% Pb, 17% Zn and 0.089% Cu.

The Big Sam East zone is rusty quartz boulders in a gossanous frost boil found over a length of 25 m. Gold assays from boulder samples range from 5.1 to 9.4 ppm Au.

The River zone is gritty pyrite in dolomitic and cherty banded rock with minor chalcopyrite, covellite and malachite. Assays for samples collected from pinch and swell quartz veinlets with abundant arsenopyrite and pyrite and siliceous chlorite schist with bands of disseminated pyrite and associated fine-grained gold, ranged from 0.17 to 0.79 ppm Au. Results of detailed mapping indicate that the auriferous zones lie within a shear or fault zone.

A DIGHEM III multisensor (electromagnetic/resistivity/magnetic/VLF) survey totalling 488 line-km was flown with 100 m spacing during July, 1987. Results of the survey were unsuccessful, but the magnetic survey was used to delineate units of iron formation.

SISSONS-SCHULTZ PROJECT

Urangesellschaft	Uranium
Suite 2812, T-D Tower	66 A/5,6,7,10,12; B/8
P.O. Box 19	64°30'N, 97°30'W
Toronto-Dominion Centre	
Toronto, Ont., M5K 1A1	

REFERENCES

Laporte (1987); Urangesellschaft (1989).
DIAND assessment reports: 082272, 082417, 082623.

PROPERTY

Sissons-Schultz South:
SHAY 5 - B 71397.
SHAY 6 - B 71398.
BILA 3 - B 71370.
TREE 4 - B 71413.
Dormant are claims listed on Figure 5-15.
Kiggavik (Lone Gull):
L 1 to L 620.
SSL 1 to SSL 128.

LOCATION

The Sissons-Schultz project area extends north and northeast from Judge Sissons Lake to Schultz Lake and to the Thelon River and includes both the Sissons-Schultz South project (BILA, SHAM and TREE) and the Kiggavik (Lone Gull) project. The SHAY claims are 15 km northeast of Judge Sissons Lake, the BILA claims 15 km west-northwest of Judge Sissons Lake and the TREE 4 claim is approximately 20 km east-northeast of Judge Sissons Lake. The project area also includes Kiggavik deposit, formerly the Lone Gull deposit. The Kiggavik deposit is immediately north of Pointer Lake (Fig. 5-15).

HISTORY

Metallgesellschaft Canada Ltd., an affiliate of Urangesellschaft Canada Ltd., began exploring for uranium in the Keewatin during 1974. Prospecting Permits 317 to 327 were acquired to encompass the area between Judge Sissons and Schultz lakes and a radiometric survey was flown over the region. A base camp was established to investigate an anomaly (the Kiggavik deposit) and exploration expanded from that area (Urangesellschaft, 1989).

The history for all of the claims of the Sissons-Schultz project area is described by Laporte (1987) under Project K-1. Between 1978 and 1979, the claims were the subject of reconnaissance geochemical surveys, airborne VLF EM, radiometric and magnetometer surveys, geological mapping and prospecting. Numerous anomalies were outlined and 51 grids were established (Laporte, 1987).

BILA 3, SHAY 5, 6 and TREE 4 were recorded in June, 1978. The End grid was established on BILA 6 in 1979, to follow up on an airborne VLF conductor but no further work was done on the grid until 1986. Airborne resistivity lows were detected on SHAY 5 and 6 but were not examined at that time (DIAND assessment report 082272).

Diamond drilling on the Kiggavik deposit began in 1977. Between 1977 and 1985 two major zones were identified and tested. The Main zone and Centre zone were drill tested by

16 350 m in 96 holes and 5323 m in 47 holes respectively. Additional anomalies in the area were tested by an aggregate of 14 447 m of diamond drilling in 114 holes (Laporte, 1987).

DESCRIPTION

The following is summarized from Laporte's (1987) description of the regional geology of the project area. The basement rocks of the area are an augen gneiss, quartz diorite and granodiorite, overlain by volcanic massive and pillowed flows grading in the west to amphibolite and amphibolite gneiss. The volcanics are overlain by a sedimentary assemblage which includes iron formation, lithic to feldspathic greywackes, pelites, feldspathic to quartzite arenites and wackes, dolomite and calcareous siltstone. The sediments grade westward into biotite gneisses and are overlain by white orthoquartzite. The sediments and volcanics are considered to be Archean in age and are intruded by late Archean monzonite, diorite and quartz monzonite and early Aphebian fluorite-bearing biotite-granite and syenite. The youngest supracrustals are members of the Dubawnt Group and include quartz-hematite breccia and sandstone and conglomerate of the Thelon Formation.

Three generations of faults cut the belt. The dip of the rocks throughout the belt ranges from shallow to steep. The belt is considered to be an east- to northeast-trending anticline.

The End grid on BILA 6 and the Siamese East grid on SHAY 5 and 6 cover dirty quartzites of the Hurwitz Group in contact with intrusions of the Dubawnt Group. Metagreywackes are restricted to the northeast corner of the Siamese East grid. The End grid is cross-cut by an east-trending fault referred to as the North Sissons Fracture zone (DIAND assessment report 082272). The TREE claim is underlain by feldspathic arenite, greywackes, felsic tuff, gabbro and derived phyllites and sericite, muscovite, muscovite-chlorite and chlorite schists of the Aphebian Hurwitz Group. The rocks are intruded by lamprophyre dykes and a syenite intrusion in the west (DIAND assessment report 082417).

The Kiggavik deposit is hosted by arkosic or dirty quartzites and metapelites intercalated with garnetiferous impure quartzites, mafic chloritic metasediments and well laminated siliceous beds (Laporte, 1987; DIAND assessment report 082623). The metasediments are intruded by granite, quartz-feldspar porphyry, lamprophyre, syenite and diabase (Fig. 5-17; Laporte, 1987).

Ore zones are in a graben structure that trends 095° and cross-cuts a fluorite granite with well developed shear zones trending 065°. The Main zone and the Centre zone lie along the same shear zone. The Main zone comprises two cylindrically shaped ore zones plunging 25° at 065° at the fault contact between dirty quartzites in the north and a granite intrusion in the south (Urangesellschaft, 1989). The Centre zone comprises two essentially flat lying lenses above and below an orthoquartzite layer that follow the shallow dip of the orthoquartzite. (Urangesellschaft, 1989; DIAND assessment report 082623).

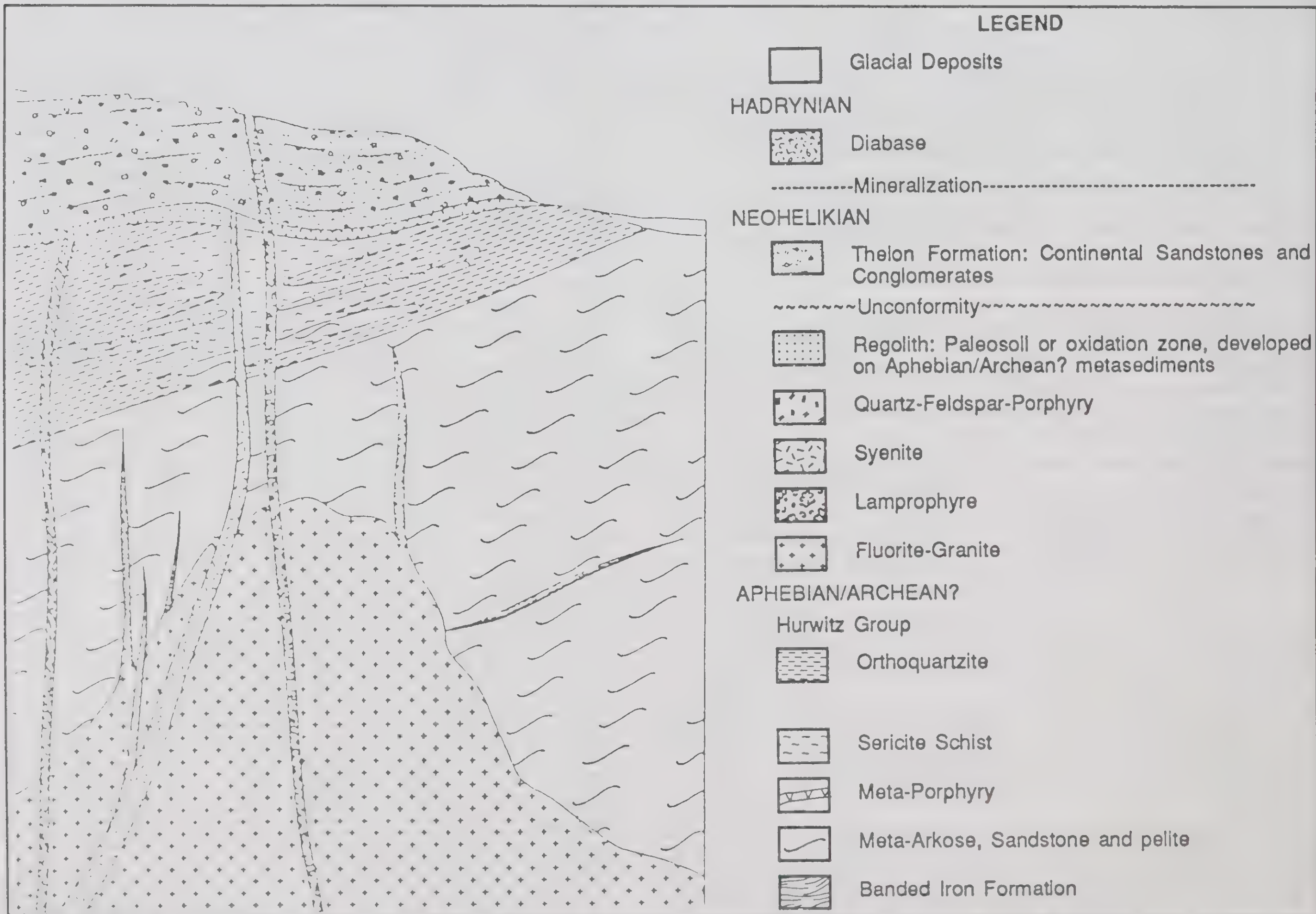


FIGURE 5-17: Stratigraphy of the Kiggavik deposit (schematic, modified after Urangesellschaft, 1989).

The principal uranium mineral, coffinite, mantles and replaces pitchblende. Coffinite also forms rosettes or colloform aggregates in, or adjacent to, fractures and joints, as well as minor amounts of fine-grained disseminations throughout the host rocks. Sulphide content is less than 2% and consists of pyrite, marcasite, chalcopyrite and galena (DIAND assessment report 082623).

An alteration halo of clays (illite and sericite) replacing primary feldspars of the sediments and intrusions, boron enrichment and chloritization of mafic minerals is associated with uranium in fracture zones (Laporte, 1987). Alteration has resulted in a density decrease for the altered rocks from about 2.7 to 2.2-2.4 t/m^3 (DIAND assessment report 082623).

CURRENT WORK AND RESULTS

During 1986, work on BILA 3 (End grid) and SHAY 5 and 6 (Siamese East grid) comprised mapping, prospecting and VLF, gravity, resistivity and magnetic surveys. A strong gravity low, close to an assumed contact between dirty quartzites and intrusions, was defined on the End grid and related to a possible alteration zone. Radioactivity on the Siamese East grid was confined to hematized granitic intrusions. Geophysical surveys detected a resistivity low with coincident VLF conductor and gravity low in the central portion of the grid.

A DIGHEM IV electromagnetic survey totalling 412 line-km was flown over known areas of alteration to test the viability of the system. Alteration zones were most clearly delineated on the 56 000 Hz frequency with resistivity of between 3000 kΩ·m to 4000 kΩ·m. The Siamese East, Siamese South grids (immediately to the southwest of Siamese East) and Bar-3/Fox area (immediately to the southwest of the Siamese South grid) were surveyed. A poorly defined linear resistivity low was detected at the southwest end of the Siamese East grid.

In 1987, the TREE 4 claim was mapped and sampled. A total of 5.8 km of VLF and magnetic surveys were conducted on test lines oriented at 035°. Two strong VLF conductors were defined, one coinciding with a magnetic anomaly and syenite dyke. Mapping outlined zones of quartz-carbonate veining parallel to foliation, gossan zones and radiometrically anomalous areas in the vicinity of biotite lamprophyre and syenite dykes.

Work on the Kiggavik project area during 1986 and 1987 comprised a pre-feasibility study and further diamond drilling. In 1986, a 471 m strike length of the Main zone was tested by 54 drill holes totalling 7153 m. A regular pattern of drill holes, spaced approximately 15 m apart on 30 m sections, was adopted to facilitate geological interpretation and evaluation of grade and tonnage. The Centre zone was tested by 21 holes, spaced approximately 15 m apart on sections 15 to 20 m apart. A total of 2344 m was drilled on the Centre zone. Drilling on the Main zone and Centre zones in 1987 totalled 4095 m in 32 holes and 1238 m in 14 holes respectively.

At the end of 1987, geological reserves, recalculated using the results of the 1986 and 1987 drilling, were estimated to be 21 700 t with an average ore grade of 0.63% U_3O_8.

MARJ CLAIMS

PNC Exploration (Canada) Co. Ltd.	Uranium
2401, 650 W Georgia St.	66 B/3,6
Box 11571, Vancouver Ctr.	64°25'N, 99°23'W
Vancouver, B.C., V6B 4N8	

REFERENCES

Laporte (1974a, 1983a,b, 1987); Le Cheminant *et al.* (1983).
DIAND assessment report: 082121.

PROPERTY

MARJ 3-11 (F10345-F10353).
MARJ 12-16 (F11051-F11055).

LOCATION

The claims are 26 km south of Aberdeen Lake on the north shore of Marjorie Lake, approximately 150 km west-southwest of the Town of Baker Lake (Fig. 5-18).

HISTORY

During the 1960s, Aquitaine Company of Canada held prospecting permits covering much of the eastern portion of Aberdeen Lake and south to Marjorie Lake. Prospecting Permit 165 encompassed the area of the current claims. An airborne gamma-ray spectrometer and magnetometer survey was flown, but no strong radiometric anomalies were detected.

Between 1975 and 1980, Urangesellschaft acquired an extensive land position throughout the region and held the claim area as Prospecting Permit 354, along with the MAJ, AB and BB claims. The area was explored with airborne radiometric, VLF EM and magnetometer surveys, geological mapping, prospecting and limited stream sediment sampling. Fracture-related uranium targets were drilled in 1982 on the AB claims with no significant results.

PNC Exploration (Canada) Co. Ltd. staked MARJ 1-11 in 1983 and MARJ 12-16 in 1984. Airborne radiometrics followed by ground radiometric surveys, regional mapping, boulder prospecting and lake sediment sampling surveys were carried out during 1983 and 1984. Grids were established over an unconformity, a boulder showing and an interpreted fault (based on a geophysical survey). Detailed work on the grids included geological mapping, boulder prospecting and geophysical surveys. In 1985 detailed work on the fourth grid, established on MARJ 12 and 13, outlined six radioactive boulders near an east-trending photogeological lineament. MARJ 1 and 2 lapsed in 1985.

DESCRIPTION

The regional geology is described by Laporte (1987). The grid area is extensively drift covered, with approximately 2% exposure of outcrop or subcrop. Underlying the grid is a heterogeneous assemblage of late Archean or early Proterozoic intrusions and gneissic or migmatized equivalents. Common intrusions are hornblende or leucocratic granite; aplite; quartz diorite to diorite; quartz monzonite, gabbro and undifferentiated intrusions. Units of red hematized breccia and a red aphanitic rock have been preferentially eroded yielding radioactive boulder clusters. Granitic to quartz monzonitic and granodioritic to quartz dioritic gneisses strike northeast to east and dip north at 36° to 80°. Joint sets with varying orientations are steeply dipping. A vertically to steeply dipping, polyclastic, mylonitized lineament trends east across the centre of MARJ 13. Two exposures of silicified andesite are northwest and south of the two claims and a gossan is on the shoreline of Marjorie Lake, near the southwest corner of MARJ 13.

CURRENT WORK AND RESULTS

Exploration in 1986 concentrated on the "Amethyst grid" and surrounding areas of MARJ 12 and 13. Geological mapping traced a train of radioactive boulders, coincident with an extrapolated photolineament. A total of 122 boulder and bedrock samples were collected. When compiled with previous results, an arithmetic mean of 0.693% U_3O_8 was calculated from assays of 251 boulders from the grid area.

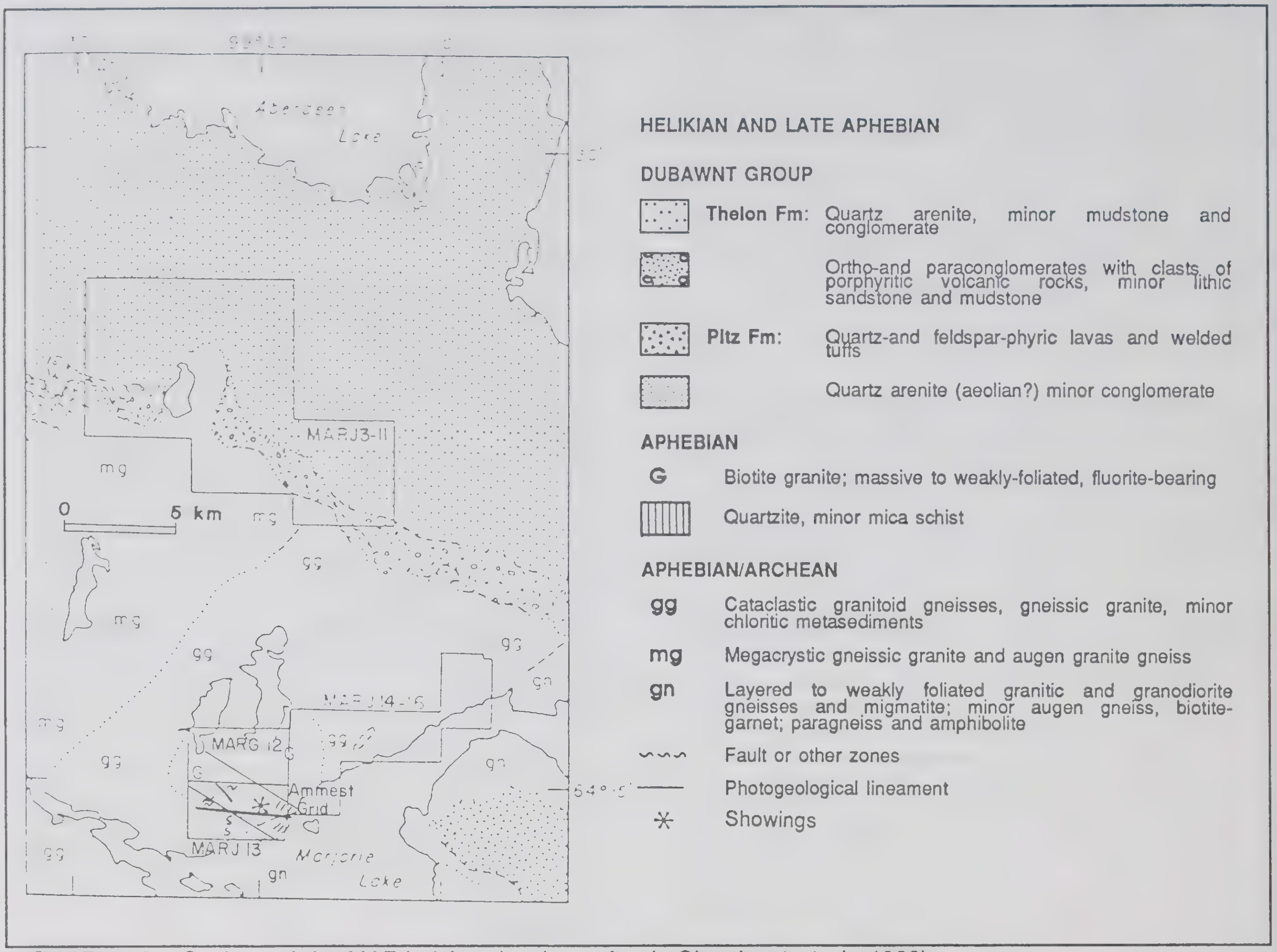


FIGURE 5-18: *Geology of the MARJ claims (geology after LeCheminant et al., 1983).*

Track Etch cup retrieval and soil sampling surveys were performed concurrently in selected areas of the grid. A number of weak soil anomalies were delineated. Track Etch cups were recovered after burial for 11 months, but gave questionable results. Radiometric block mapping, surficial geological mapping, magnetometer and VLF EM surveys were completed.

A total of 1002.84 m of diamond drilling in 12 holes tested showings and structural targets. No significant intersections were recovered.

CHANTREY INLET - WAGER BAY AREA

Laporte (1977) describes the geology of the Chantry Inlet-Wager Bay area as "a discontinuous belt of Archean volcanic and sedimentary rocks enclosing ultramafic flows and sills [which] trends northeast across the central part of the Chantrey Inlet-Wager Bay Area. The belt lies in a granitic basement complex consisting of north to east trending belts of felsic to mafic gneisses within gneissic or massive granitic intrusions of Archean and Aphebian age."

Heywood (1961) noted a number of komatiite outcrops, as well as sulphide- and oxide-facies iron formation within the region that has attracted sporadic interest in the nickel and gold potential of the area. Schau (1982) mapped a 3 by 3 m outcrop of soapstone which was used as carvingstone by local artists in Repulse Bay.

PERMIT 1090

Comaplex Resources Ltd.	Gold, Platinum
901 - 105 4th St. SW	56 K/3 NW
Calgary, Alta., T2R 1J4	66°10'N, 93°22.5'W

REFERENCES

Schau (1982).
DIAND assessment report: 082146.

PROPERTY

Prospecting Permit 1090 (56 K/3 NW Quadrant).

LOCATION

The permit is approximately 250 km northeast of the Hamlet of Baker Lake (Fig. 5-1).

HISTORY

Aquitaine Company of Canada Ltd. worked in the vicinity northeast of Prospecting Permit 1090 during base metals exploration, from 1970 to 1972. The company staked the ENG claim group on the eastern boundary of Prospecting Permit 1090. An EM and magnetic survey was flown over the Aquitaine permits and claims, but few conductors were detected and follow-up ground geophysics, mapping and prospecting failed to delineate any zones of economic interest.

DESCRIPTION

The permit is underlain by meta-komatiites, metasediments, quartzites, phyllites, chlorite schists, iron formation and conglomerates of the Archean Prince Albert Group. Metamorphic grade is upper greenschist facies with kyanite. A small granitic stock intrudes in the northeast of the permit area and a granite pluton underlies the western portion of the permit area. Spinifex textures in komatiites have been recorded in the east central area of the permit and an arsenopyrite showing was mapped at the eastern contact of the northeast granitic stock (Schau, 1982).

Foliation in the permit area strikes from north-northeast to east-northeast and dips sub-vertically. A late phase of folding and faulting with northwesterly trends is indicated by small drag folds, kinking in ultramafic flows, northeasterly trending protuberances in the granite contact and the orientation of diabase dykes and local arsenopyrite veins (DIAND assessment report 082146).

CURRENT WORK AND RESULTS

Reconnaissance geological mapping and prospecting surveys were conducted on the permit area during 1986. The surveys delineated beds of oxide-facies iron formation, 60 to 120 m thick, in the central and eastern portions of the property. Two samples from shear zones at metapelite-ultramafic flow contacts in the southwest and central portions of the permit yielded 1.2 and 0.9 ppm Au respectively. The second sample also contained 0.51% Ni. A sample from a sheared metapelite, hosting a quartz vein system and pyritic gossan, assayed 10.85 ppm Ag and 0.54% Cu.

Arsenopyrite forms disseminations, veins less than 1 cm wide and fracture fillings at the eastern contact of the northeastern granitic stock.

Samples of ultramafic flows were assayed for nickel, chromium, platinum and palladium.

QUILIK, M1 AND M2 CLAIMS

Megagem	Carvingstone, Precious
Box 1406	Metals, Base Metals
Yellowknife, NWT, X1A 2P1	56 M/6,11,12
	67°40'N, 95°30'W

REFERENCES

Heywood (1961); Frisch *et al.* (1985); Cerny (1989).
DIAND assessment report: 082635.

PROPERTY

QUILIK 1 (F12225).
M1-M2 (F12226-F12227).

LOCATION

The claims are on the east shore of Chantry Inlet. M1 and M2 are south of Cape Barclay and the QUILIK 1 claim is off shore on an island northwest of the Victoria Headland (Fig. 5-1).

HISTORY

Carvingstone deposits on the claims were discovered in 1978 by Simon Higiniq, who had been quarrying soapstone in the area. QUILIK and M1 were staked in August of 1985 by Alex Beaulieu and Simon Higiniq. M2 was staked in 1986 at which time the claims were transferred to Megagem Ltd.

DESCRIPTION

The QUILIK 1 claim is underlain by the Chantrey belt. The Barclay belt (Cerny, 1989), a parallel belt of metamorphosed supracrustal rocks, cross-cuts the M claims. Heywood (1961) suggested that the belt may represent a northern extension of the Hurwitz Group. Frisch (1985) suggested that deposition of these rocks was coeval with the deposition of Chantry Group rocks (Fig. 5-19).

The Chantrey Group rocks are amphibolite-grade metasediments, including carbonate and quartzitic rocks, overlain by fine-grained pelites/psammites, quartzite, metaconglomerate and pyrite schist. A persistent carbonate unit comprises calcitic or dolomitic marble with siliceous interbeds and variegated calcsilicate layers (Frisch, 1985). Chiastolite porphyroblasts up to 25.0 cm (average 2.0 to 3.0 cm) long, as well as garnet and biotite, are developed in pelitic schist (Frisch, 1985). The supracrustals are intruded by pegamatites and quartz veins. Overgrowths of euhedral quartz crystals with rare fibrous aggregates of hematite are found within quartz vein cavities (Cerny, 1989). The Chantry Group rocks are tightly folded to form a doubly plunging, northeast-trending syncline, 5 km wide and 175 km long, in apparent unconformable contact with basement rocks.

Metavolcanics, metapelites, chlorite schists, silicate-facies iron formation and subordinate quartz-eye schist, amphibolite, oxide-facies iron formation, marble, quartzite and meta-conglomerate comprise the rocks of the Barclay belt. Andalusite, cordierite and staurolite porphyroblasts are found within the metapelites. The belt trends in a northeasterly direction for 60 km and has a maximum width of 5 km (Cerny, 1989).

The supracrustal rocks are intruded by leucogranite bodies and pegmatites. Beryl and garnet are accessory minerals in the pegmatites. Quartz veins carry tourmaline along contacts and euhedral quartz crystals within vugs (Cerny, 1989).

CURRENT WORK AND RESULTS

Work on the property during 1986 and 1987 consisted of mapping, trenching and sampling "unusual" pyritic rocks, coloured prismatic stones and crystals. Samples were analyzed for gold, silver, copper, zinc, arsenic, beryllium and tantalum, although the emphasis was on finding carvingstone and gemstone materials. A total of 80 samples were collected. One sample of garnet gneiss, adjacent to amphibolite on M1, assayed 4.1 ppm Au, 7.5 ppm Ag and 20.8% Zn.

A business proposal was developed late in 1987 to establish an arts and crafts industry supplying marble for carvingstone use and collecting mineral specimens such as garnet and quartz crystals.

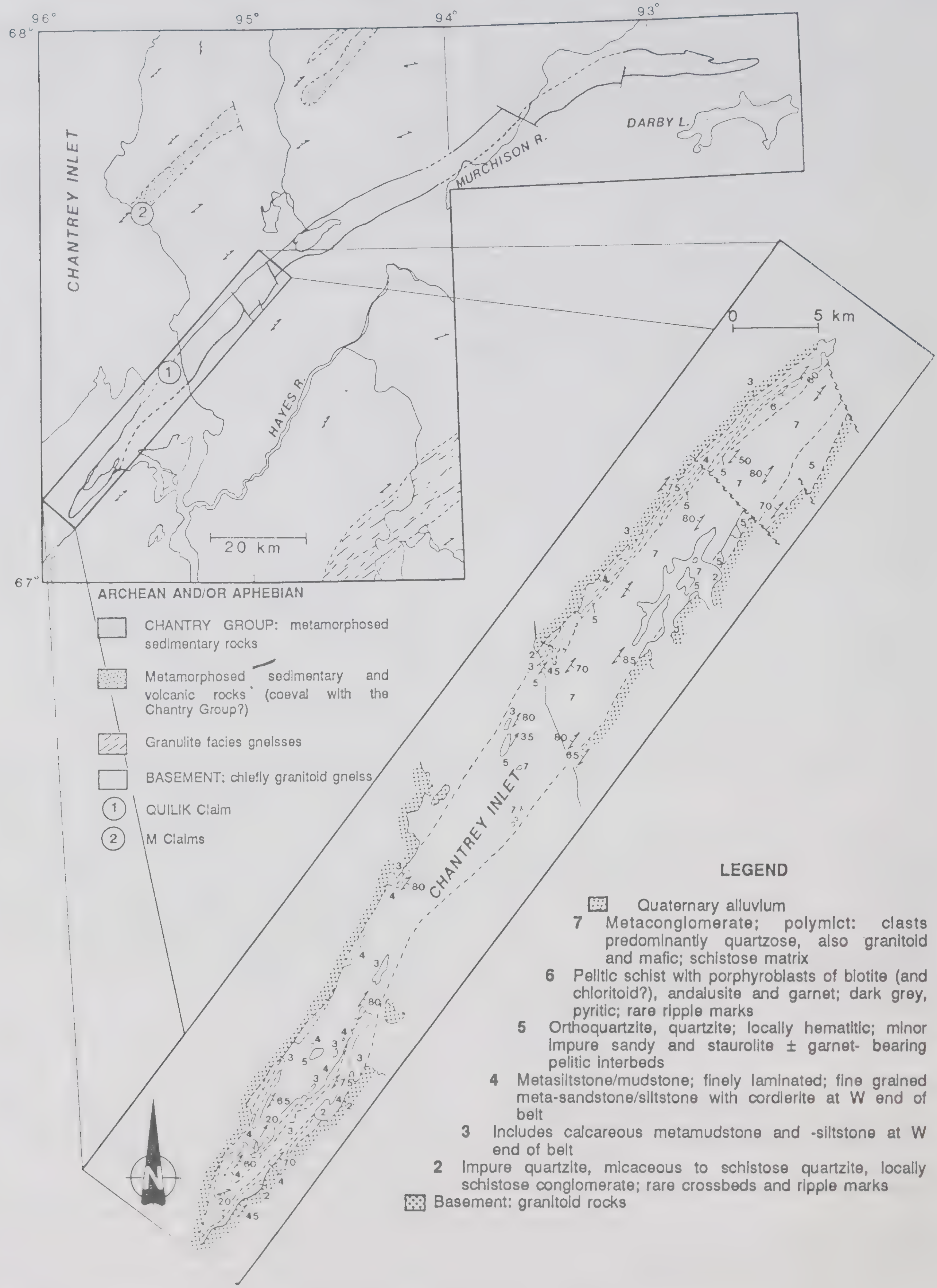


FIGURE 5-19: Geology of the Chantry Inlet area (after Frisch et al., 1985).

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CHAPTER 6
SOUTHEAST MACKENZIE DISTRICT

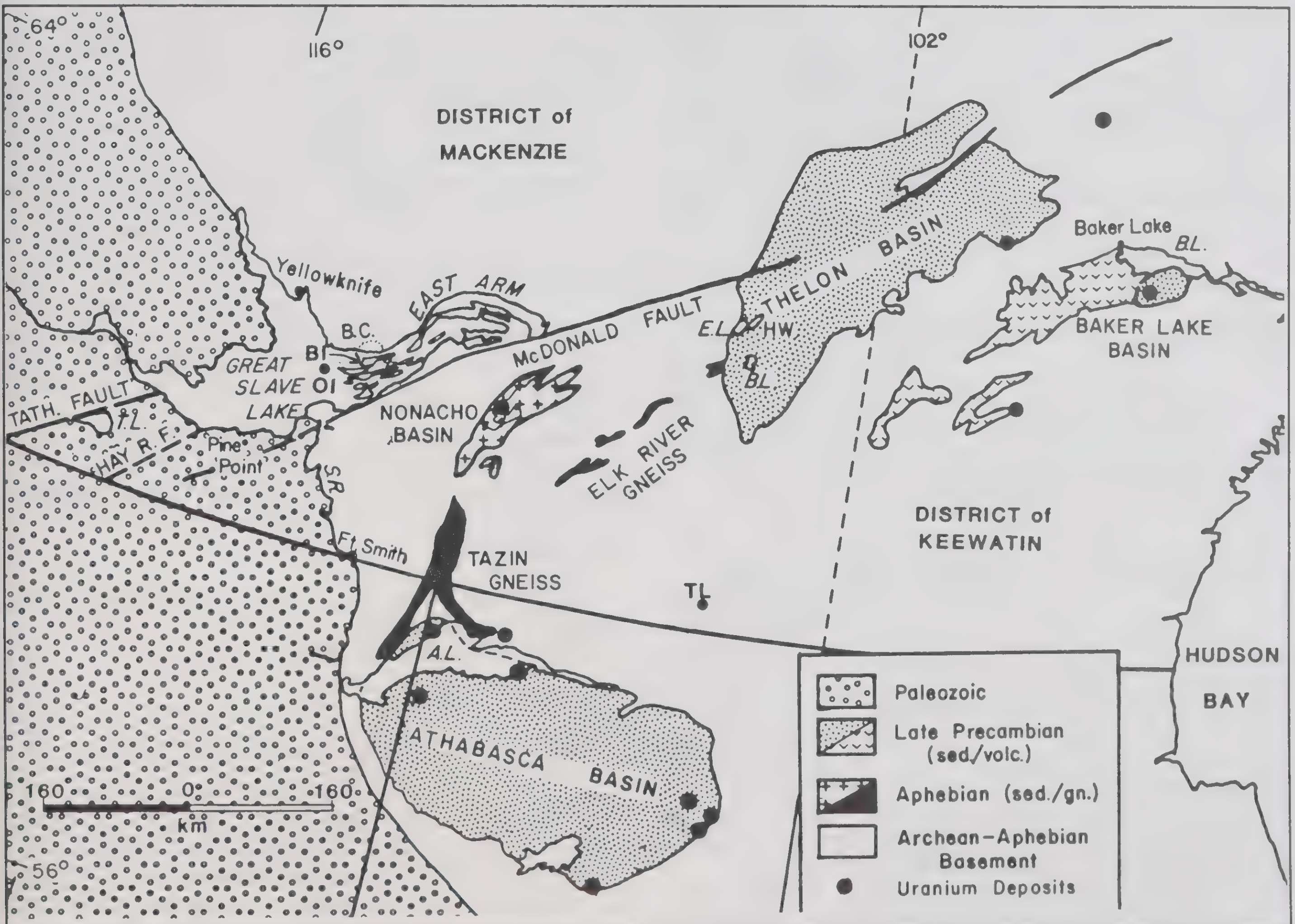
Walter A. Gibbins
District Geologist

INTRODUCTION

The southeastern District of Mackenzie includes Paleozoic carbonates of the Great Slave Plain, where lead-zinc is the main exploration target, and part of the Churchill Province of the Precambrian Shield (Fig. 6-1). This part of the Shield has recently been subdivided into the 1.8 to 2.0 Ga Taltson Magmatic Zone in the west (Fig. 6-2) and the pre-2.5 Ga Rae terrane on the east (Hoffman 1987, 1988a; Bostock *et al.*, 1987). From 1980 to 1985, uranium was actively sought in the western Thelon Basin, Nonacho Basin and east arm of Great Slave Lake (Gibbins 1984, 1985, 1987). However, by 1986 uranium exploration had ceased. Similarly lead-zinc exploration and mining in Devonian carbonates of the Pine Point District came to an end in early 1987.

In contrast there was an increase in base- and precious-metal exploration and a continued strong exploration effort and feasibility studies at Highwood Resources Ltd.'s niobium-tantalum and gallium-beryllium-yttrium-zirconium-rare earth deposits in the Blatchford Lake Complex. In September 1986, Highwood Resources Ltd. entered into an agreement with Hecla Mining Company of Canada Ltd. to assess and possibly bring the Thor Lake deposits into production.

Other exploration included a Dighem electromagnetic survey of the Outpost Islands by Rapparee Resources Ltd. in September 1987. The Outpost Islands (OI in Fig. 6-1) are the site of a former gold-tungsten-copper mine, the Fox Mine, that operated in the 1940's (Lord 1951, p. 236-240).



AL - Lake Athabaska	BI - Blanchet Island	*EL* - Eyeberry Lake	OI - Outpost Islands	*TL* - Thye Lake
BC - Blatchford Lake Complex	*BL* - Beaverhill Lake	HW - Hurwitz quartzite	*SR* - Slave River	

FIGURE 6-1: *Map of the southeast Mackenzie District, Dubawnt and Athabaska Basins.*

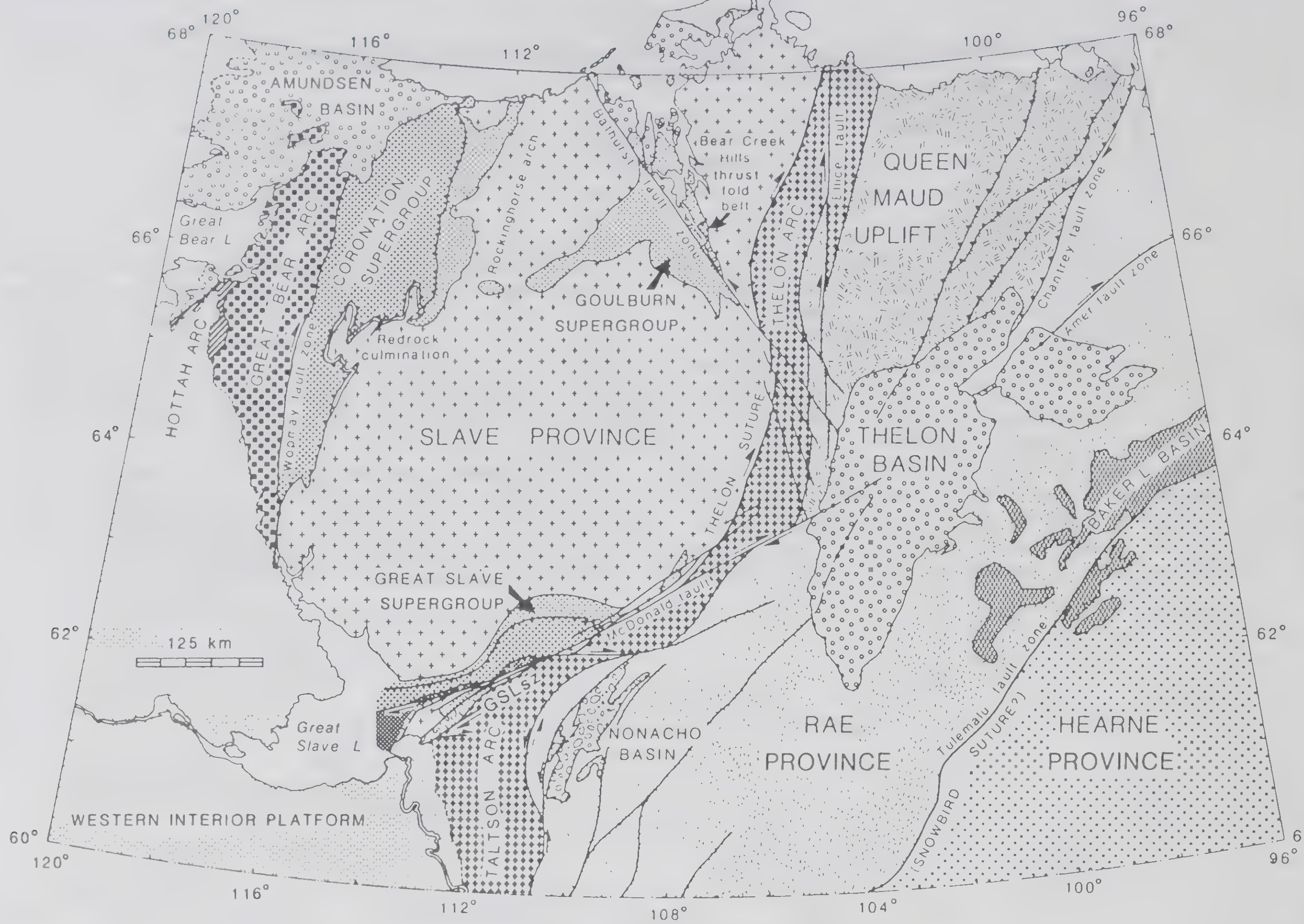


FIGURE 6-2: The northwest Canadian Shield showing tectonic elements (from Hoffman, 1988a).

Ultramafic rocks in the Snowbird Lake map sheet, NTS 75 A (Taylor, 1963) became the target for platinum group element exploration. Several claims were staked in the Thye (Thoa) Lake-Opescal Lake area (TL in Fig. 6-1).

EAST ARM OF GREAT SLAVE LAKE

Hoffman *et al.* (1974, 1977) named the east arm area the "Athapuscow Aulacogen". It is a deformed east-northeast-trending basin, 270 km long by at most 80 km wide, containing little metamorphosed early Proterozoic sedimentary and magmatic rocks exposed in and around the east arm of Great Slave Lake. Hoffman (1977, 1988b) subdivided the Late Aphebian Great Slave Supergroup into the Union Island, Sosan, Kahochella, Pethei and Christie Bay Groups. They are unconformably overlain by the Helikian Et-Then Group and underlain by the Early Aphebian Union Island Group.

The east arm of Great Slave Lake area has been prospected and explored during the past 40 years, resulting in the discovery of numerous copper, uranium, nickel-cobalt, gold and silver showings. However, economically viable deposits have not been discovered to date. Mineral rights for much of the east arm were withdrawn under Order in Council P.C. 1970-526.

CARMEN 1 CLAIM

Highwood Resources Ltd.	Cobalt, Nickel
12th Floor, 20 Toronto St.	85 H/15
Toronto, Ont., M5C 2B8	61°57'N, 112°45'W

REFERENCES

Badham (1978); Badham and Muda (1980); Hoffman (1977, 1981, 1987, 1988b); Hoffman *et al.* (1977).

DIAND assessment report: 082592.

PROPERTY

CARMEN 1.

LOCATION

The CARMEN 1 claim is at the southwest end of Blanchet Island. Blanchet Island is an uninhabited, sparsely forested, east-northeast-trending island, 45 km long and 3 to 12 km wide, south of the Hearne Channel, in the east arm of Great Slave Lake (BI in Fig. 6-1).

Access is by aircraft, boat in summer or tracked vehicle in winter and early spring. Blanchet Island is 100 km east-southeast of Yellowknife and 215 km northeast of Hay River.

HISTORY

The CARMEN 1 and nearby HRL claims (see next report) were staked in December 1984. There are no records of work or assessment reports for the CARMEN 1 area. However, there are a number of small excavations that were probably made at the time of cobalt-nickel mining on Blanchet Island in 1969-70.

DESCRIPTION

The geology of the east arm of Great Slave Lake has been mapped (Hoffman, 1977, 1988b) and discussed by Hoffman (1981, 1987) and Hoffman *et al.* (1977). A line of 1.87-1.86 Ga calc-alkaline intrusions, known as the Caribou Laccoliths (Hoffman, 1977, 1981, 1988b) may be causally related to subduction of a re-entrant of oceanic lithosphere south of the Slave Province (Hoffman, 1987). At the margins of some of these intrusives cobalt-nickel arsenide veins, occasionally silver bearing, are locally developed (Badham, 1978; Badham and Muda, 1980).

CARMEN 1 includes mainly Caribou Laccolith diorite, with underlying Stark Formation argillite. The diorite is oxidized 5 to 50 m above its lower contact, causing red weathering.

CURRENT WORK AND RESULTS

In September 1987, a two-person crew mapped and prospected the diorite contact and sampled favourable-looking rocks and structures. Minor mineralization products were noted at three places. Two are on a west-facing cliff near the centre of the claim. The most interesting of these is a film of nickel-cobalt arsenide, as well as malachite and erythrite stains, on joints and fractures in the diorite within 2 m of the contact with underlying Stark Formation argillite. A chip sample over 50 cm assayed 0.3% Co.

A second prospect is a malachite stain and a 1 by 10 cm patch of chalcopyrite near the red-grey diorite transition. Both of these have evidence of earlier trenching or pitting.

The third, near the southwest corner of the claim, contains weak malachite staining and a few specks of chalcopyrite in quartz veins.

No significant cobalt-nickel minerals or alteration were found. Exploration of the contact below the diorite would require geophysical methods.

HRL 1, 2 CLAIM

Highwood Resources Ltd.
12th Floor, 20 Toronto St.
Toronto, Ont., M5C 2B8

Cobalt, Nickel
85 H/16, I/1
61°59'N, 112°23'W

REFERENCES

Badham (1978); Badham and Muda (1980); Hoffman (1977, 1981, 1987, 1988b); Hoffman *et al.* (1977); Mason (1969); Murphy (1971); Padgham *et al.* (1978).

DIAND assessment report: 082591 (other assessment reports: 060836 and 060088).

PROPERTY

HRL 1 and 2.

LOCATION

Blanchet Island is a 10 by 45 km island at the western end of the east arm of Great Slave Lake (BI in Fig. 6-1). It is separated from the mainland by the Hearne Channel. The HRL claims are along the southeast shore of Blanchet Island, near the point midway along the island where the width of the island decreases suddenly (Fig. 6-3a).

The claims are 115 km east-southeast of Yellowknife and 220 km northeast of Hay River.

HISTORY

In 1968 F. Giauque of Yellowknife discovered the principal cobalt-nickel showing on Blanchet Island, after observing cobalt stain from an aircraft. He staked the 4 LUX claims (now the

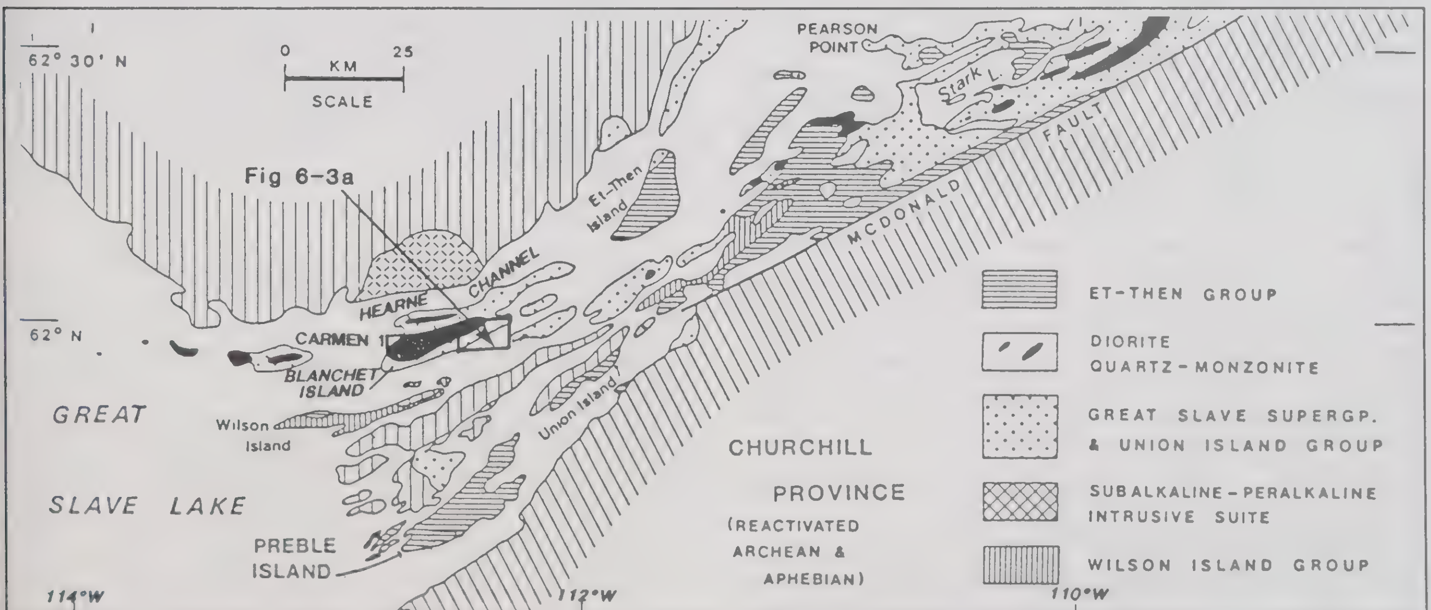


FIGURE 6-3a: Geology of Blanchet Island and adjacent areas.

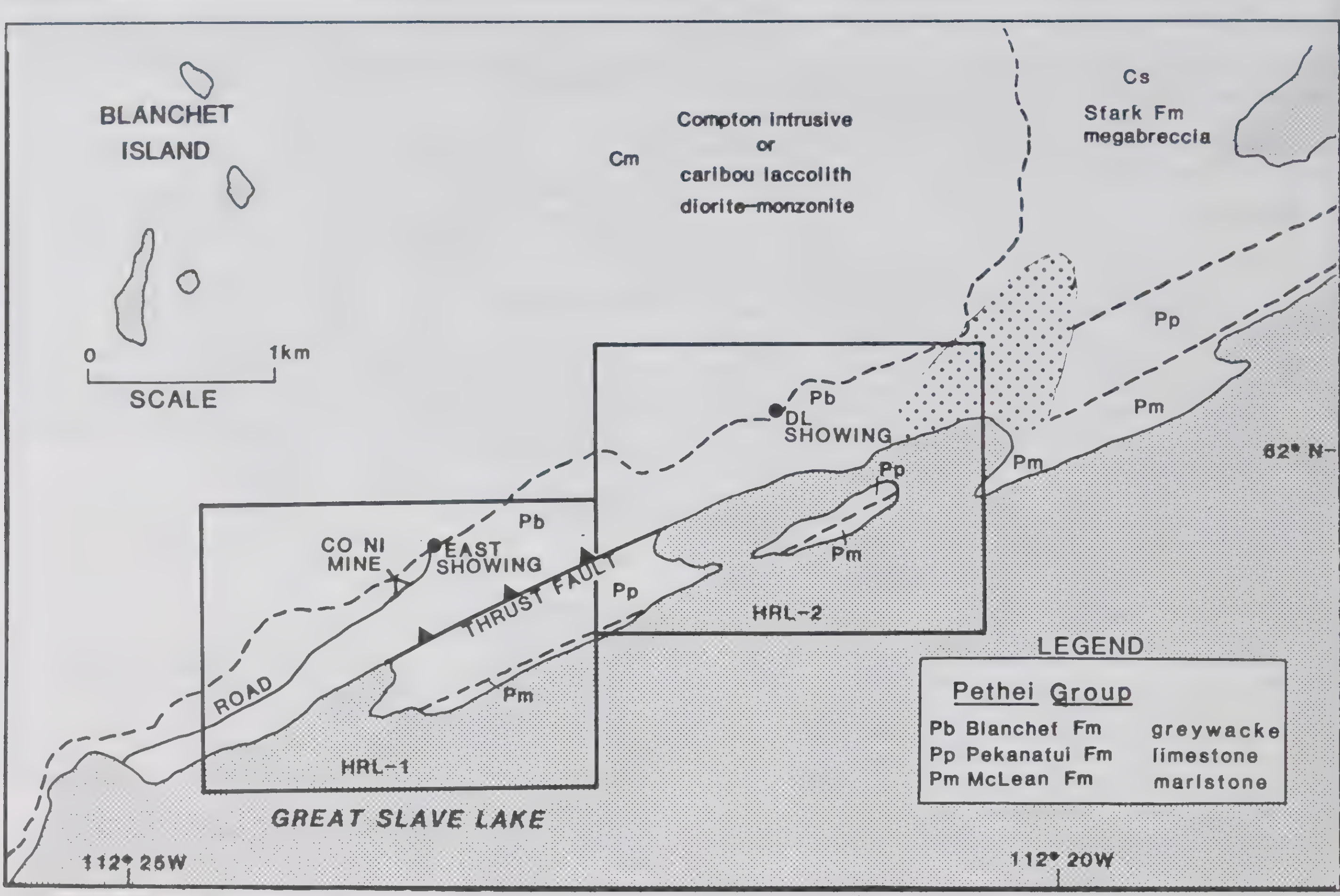


FIGURE 6-3b: HRL 1 and 2 claims and mineral showings, Blanchet Island.

HRL 1 claim, Fig. 6-3b) and optioned them to Jason Explorers Ltd. of Vancouver. Jason Explorers staked the DEE claims (1-17) to the north and west of the LUX group in 1969. The DL claims (now HRL 2) were staked in 1969 by D. Lent to cover similar mineral showings east of the DEE claims. Four XLR and five LK claims were staked along the intrusive contact southwest of the DEE group.

In 1969-70 massive nickel-cobalt arsenide ore, mainly niccolite and cobaltite, at the main showing was mined by Jason Explorers from an open cut about 10 m wide, by 7 m high and 6 m deep, and an adit 25 m long, by 2 m high and 1.5 m wide. A trench was cut 8 m east of the adit 6 m long, by 2 m wide and 2.5 m deep. Initially, selected material from the open cut was bagged for shipment, but in later mining from the adit, a rail cart was used to haul high-grade ore from the adit. It was then dropped down a 25 cm by 20 m long steel tube into 45 gal drums. A short road connects the mine to the camp and loading dock, 1500 m to the southwest (Fig. 6-3b). Apparently some 130 t of high-grade Ni-Co arsenide ore (25% Ni + Co) was mined, and of this 90 t was shipped to Ugine Kuhlmann SA of France. Murphy (1971) reported that there were 40 barrels (each about 1 t) at the loading dock, but according to D. Smith (1988, personal communication) only 10 barrels of badly weathered arsenides remain.

In 1969 Jason Explorers drilled 15 diamond drillholes (E core) on the LUX group ranging from 5.4 to 19.5 m deep and totalling 191.1 m (DIAND assessment report 060088). These were collared in the area immediately above the open cut, mostly in diorite, and were intended to explore the intrusive/sedimentary contact. Cobalt-nickel minerals were intersected in 7 holes, apparent thicknesses ranged from 0.1 m to 5.9 m but no assays were done. In 1970 a magnetometer survey was carried out on the DL claims and 11 holes (E core) totalling 190.5 m were drilled in the vicinity of a cobalt-nickel showing (DIAND assessment report 060836). Four holes drilled through the diorite intersected a thin high-grade cobalt-nickel arsenide vein in a cut 6 m long by 2 m by 2 m.

The HRL claims, comprising 500 ha, were staked in December, 1984.

DESCRIPTION

The geology of the east arm of Great Slave Lake has been mapped and discussed by Hoffman (1977, 1981, 1987, 1988b) and Hoffman *et al.* (1977). The core of Blanchet Island, including the HRL claims, is underlain by a large 2.5 km long diorite-monzonite intrusion, which is one of the Compton intrusive suite (Hoffman, 1988b) or Caribou Laccoliths (Hoffman, 1977). A line of these intrusions follows the axis of the east arm (Hoffman, 1988b) and may be causally related to subduction of a re-entrant of oceanic lithosphere south of the Slave Province (Hoffman, 1987). At the margins of these intrusives, cobalt, nickel and copper arsenide minerals, some silver bearing, have been discovered (Badham, 1978, Badham and Muda, 1980), including several showings on Blanchet Island.

Figure 6-3b shows the geology in the vicinity of the HRL claims. Aphebian sediments of the Pethei Group, Great Slave Supergroup, dip northwestward at 25 to 40 degrees under diorite of a Caribou Laccolith. A prominent escarpment up to 90 m above the lake level trends northeasterly across the claims. The diorite-sediment contact undulates across this escarpment with a wavelength of about 100 m and an amplitude of 30 m. Three showings of cobalt-nickel minerals have been found in the sediments immediately below this contact (Fig. 6-3).

All showings seem to be confined to an area within 5 m of the diorite-sediment contact. Each showing is hosted by a thin dolomite unit which has been veined and brecciated more or less parallel to the contact. The mineralization, principally grey cobalt-nickel arsenides and lesser niccolite, forms pods, veins, matrix fillings and replacements of this unit. Close to the contact magnetite seems to replace carbonate and actinolite in more siliceous beds, leading to the view that the deposits are developed in skarn zones. The cobalt-nickel minerals appear related to antiformal parts of contact undulations, previously described as crenulations or cusps.

Small-scale mining operations (a 20 by 5 by 5 m open cut, and a 25 m adit) have removed much of the high-grade cobalt-nickel mineralization, leaving only scattered remnants. According to James Kelly, who visited the deposit during mining, the vein was 10-12 m long and 15.2 cm to 2 m wide with an ore shoot 3-5 m long averaging 1.3 m wide. This vein had essentially massive cobalt-nickel arsenide. Kelly noted the presence of safflorite, rammelsbergite, niccolite and secondary uranium minerals. Murphy (1971) noted secondary annabergite and Badham (1978) identified skutterudite, cobaltite, silver and bismuth. Badham and Muda (1980) noted loellingite and bismuthinite. Mason (1969) stated that representative assays of the 1.3 m wide ore zone were in the range 15% Ni, 10% Co with 5% Bi and 60% As. It was reported that no PGE or gold was present.

CURRENT WORK AND RESULTS

In September 1987 a two-person crew briefly examined known showings and prospected the diorite-sediment contact for larger zones of cobalt-nickel mineralization. They also collected samples of radioactive arsenide minerals to test for hydrothermal U-Au-PGE concentrations similar to Coronation Hill or Nicholson Bay. Despite improved analytical methods, the gold and PGE contents remain at or below detection levels. Low silver and bismuth assays failed to confirm those of previous reports.

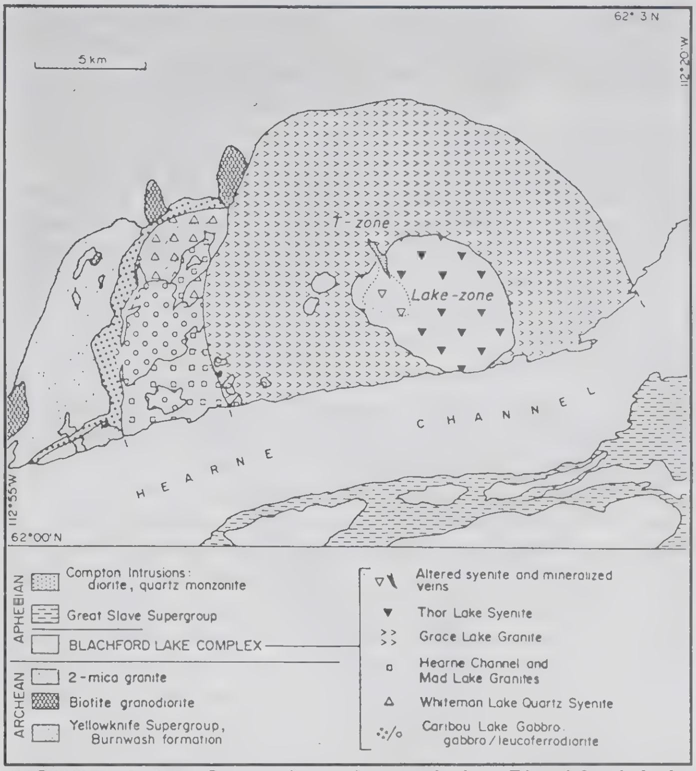


FIGURE 6-4: *General geology of the Blatchford Lake Complex, after Davidson, 1982.*

BLATCHFORD LAKE PLUTONIC COMPLEX

The Blatchford Lake intrusive suite includes all the plutonic rocks of alkaline affinity that form a coherent complex known as the Blatchford Lake Plutonic Complex. It intrudes Archean plutonic rocks and metasediments of the Yellowknife Supergroup (Fig. 6-4) at the southern margin of the Slave Province and is bounded by Blatchford Lake on the north and Hearne Channel of Great Slave Lake on the south (Davidson, 1978). Geological mapping by Davidson (1972, 1978) led to the recognition of several units that make up this multiphase, sub-circular ring complex some 23 km in diameter and 235 km^2 in area.

The suite shows a remarkable range in composition that developed as the rocks crystallized during a sequence of intrusive events documented by field relationships (Davidson, 1972, 1978). Successive units range from gabbro, with anorthosite inclusions, through leuco-ferrodiorite, quartz syenite and granite, to peralkaline granite and syenite (Davidson, 1982).

It is convenient to consider the Blatchford Lake Complex in two parts: the earlier, western part including the Caribou Lake gabbro, Whiteman Lake quartz syenite, Hearne Channel granite and Mad Lake granite, and the later, more extensive Grace Lake granite with its Thor Lake syenite core (Fig. 6-4). Rare element minerals are enriched in the later peralkaline units (Davidson, 1982).

Isotopic determinations indicate an early Aphebian age (2,150 Ma) for the Complex (Davidson, 1982). Bowring *et al.* (1984) obtained U-Pb zircon ages of 2175 ± 7 Ma for an older alkaline phase (Hearne Channel Granite) and 2094 ± 94 Ma for the younger peralkaline phase, the Thor Lake syenite.

Blatchford was incorrectly spelled as Blachford on many government maps and this spelling is still found in many references to the area.

THOR PROJECT

Highwood Resources Ltd.	Be, Ta, Nb, REE,
12th Floor, 20 Toronto St.	Y, CaF_2, U, Th, Zr
Toronto, Ont., M5C 2B8	85 I/1,2
	62°07'N, 112°35'W

REFERENCES

Davidson (1972, 1978, 1982); de St. Jorre (1986); de St. Jorre and Smith (1988); Gibbins (1981, 1983a,b, 1984, 1985, 1987); Grasty and Richardson (1972); Pinckston and Smith (1988); Smith (1985); Smith and de St. Jorre (1985); Trueman (1984); Trueman *et al.* (1984, 1988).

PROPERTY

THOR 1-45; NB 1-172; DISA 1-5 and REO 1-3.

LOCATION

The claims are centred on a small lake 105 km southeast of Yellowknife, known informally as Thor Lake, which is half-way between Blatchford Lake, 5 km to the north, and Hearne Channel of Great Slave Lake, 5 km to the south.

HISTORY

The area was staked as ODIN 1-4 in 1970 and uranium, thorium and rare earth elements (REE) were noted, but little work was done and the claims lapsed.

A government airborne radiometric survey flown in 1971 outlined a significant uranium and thorium anomaly (Grasty and Richardson, 1972). Dr. A. Davidson of the Geological Survey of Canada mapped and defined the Blatchford Lake Complex and its central core, the Thor Lake syenite (Davidson, 1972, 1978).

During the fall of 1976, Highwood Resources Ltd. personnel discovered a number of previously undiscovered mineral showings north of the original ODIN claims and staked the THOR 1-4 claims. Additional claims were staked later when spectrographic analyses indicated quantities of niobium, yttrium and rare earth elements.

In 1977, Highwood Resources Ltd. did extensive prospecting, mapping, sampling and radiometric surveying, including trenching in the T Zone (Fig. 6-5) and 335 m of diamond drilling in the S Zone (Gibbins, 1981). In 1978, 1091 m were drilled in the Lake and T zones (Gibbins, 1983a).

In 1979, work was concentrated on the Lake Zone, where five trenches and five drillholes (136 m) were completed and sampled (Gibbins, 1983b, p. 174). Wayne Johnson of Target Exploration Services Ltd. mapped the southeast portion of the claims and did a soil radon survey over the Lake Zone in 1979. In September, a crew from the Saskatchewan Department of Mineral Resources did lake-bottom radiometric, resistivity and bathymetric surveys that defined a number of radiometric anomalies beneath the shallower parts of Thor Lake (Gibbins, 1983b).

In the spring of 1980, the claims were optioned to Placer Development Ltd. who, in 1980 and 1981, drilled 18 holes (2000 m) mainly in the Lake Zone (Gibbins, 1984). The cores were logged, sampled, and measured for magnetic susceptibility and radioactivity. Three sub-horizontal mineralized layers, 10 to 45 m thick, within 100 m of the surface in the Lake Zone were identified. These layers contain 63 Mt of indicated and inferred material grading 0.03% tantalum and 0.4% niobium (columbium) with significant amounts of rare earth elements (samarium 0.1%, cerium 1%, lanthanum 0.6%) and zirconium 3.5% (Highwood Resources Ltd., Annual Report, 1981). The T Zone contains 1.15 Mt of 0.55% Nb_2O_5 inferred material with a further 5.5 to 7 Mt probable material. Some 67 000 t of 1.5% Nb_2O_5 and 0.05% U_3O_8 are drill inferred in the S Zone, and an equal amount of similar grade is possible (Highwood Resources Ltd., Annual Report, 1980).

Placer Development Ltd. relinquished the option in the spring of 1982. Highwood Resources Ltd. resumed the role of operator, shipped a 4500 kg sample for metallurgical tests and did magnetometer and scintillometer surveys along the southern limits of the property.

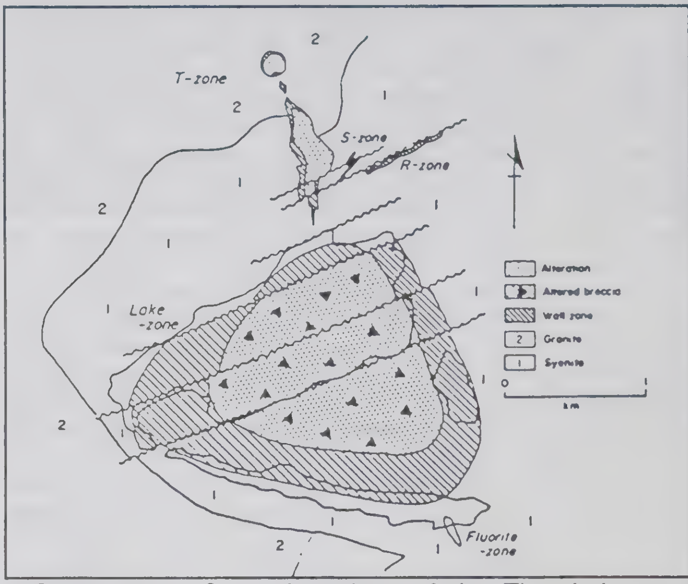


FIGURE 6-5: General geology of the Thor Lake area showing the distribution of granite and syenite, and the location of the T, Lake, R, S, and Fluorite zones, from Trueman et al. 1988.

Lake Zone

A gravity survey of the Lake Zone was completed in the spring of 1983 to provide insight as to the attitude of the mineralized zones. Modelling of the resulting Bouger gravity anomaly suggests that the tantalum-niobium-rare earth element zone extends downward in the form of an inverted cone for a few hundred metres (Trueman, 1984).

Structural studies of ultra-mylonite observed in core and outcrop, as well as offsets of lithologies, have indicated several fault systems that help explain and confirm the shape of the deposits (Fig. 6-5).

Three holes (465 m) drilled in the Lake Zone in the spring of 1984 indicate that a greater tonnage than the previously published reserve of 63 Mt probably exists at depth.

Metallurgical studies, using oil-phase extraction techniques to recover very fine-grained tantalum-niobium minerals, continued during 1983 and 1984.

Drilling during 1984 was not successful in isolating higher grade tantalum areas in the Lake Zone, but it did contribute to a revised estimate of inferred tantalum resources to 181.5 Mt (Highwood Resources Ltd., Annual Report, 1984).

T Zone

Following the recognition of important beryllium potential in the T Zone in 1983, exploration work was directed mainly toward defining grades and tonnages of this element. Work included re-logging drill core from the T Zone, detailed geological mapping (Fig. 6-6), a lithogeochemical survey to identify pathfinder elements, berylometer surveys of core and outcrops, stripping and trenching for bulk samples and a major drilling program from October 1983 to March 1984. This drilling outlined some 415 000 t of 1.0% BeO in the North T Zone and 1 180 000 t of 0.66% BeO in the South T Zone for a total of 1 595 000 t of 0.75% BeO to an approximate depth of 60 m. A total of 4174 m was drilled in 72 holes during the winter of 1983-84. The first two holes in the North T Zone intersected 21.3 m of 2.21% BeO, 3.0 m of 1.40% BeO, 21.6 m of 2.38% BeO, 4.6 m of 0.70% BeO and 12.2 m of 2.33% BeO. A 455 kg bulk sample from a pit

in this area assayed 0.93% BeO over a length of 18.3 m. A second trench, 500 m south assayed 1.61% BeO over a 19.8 m length. A total of 76 m^3 was removed by trenching (Gibbins, 1985; Trueman *et al.*, 1984).

By the spring of 1984, over 100 drill holes in the T Zone had outlined two beryllium deposits, one of 434 550 t grading 1.4% BeO and another of 1 180 000 t of 0.66% BeO (Highwood Resources Ltd., Annual Report, 1984).

During the summer of 1984, geological mapping was completed on the T Zone and extended to cover the R, S, Lake and Fluorite zones. This work was accompanied by removal of

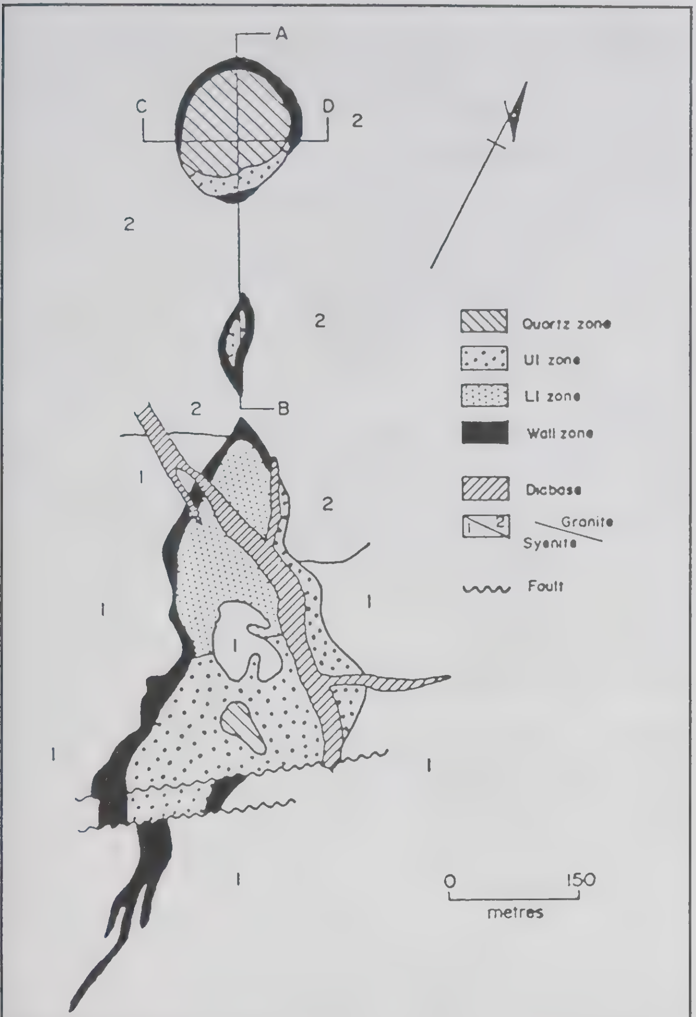


FIGURE 6-6a: *Geology of the T zone; map showing the location of sections A-B and C-D (from Trueman and others, 1988).*

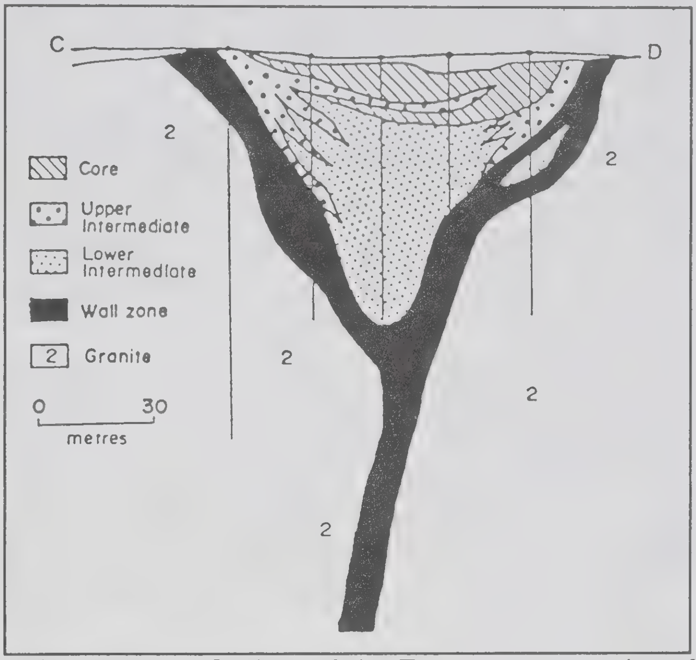


FIGURE 6-6c: *Geology of the T zone; cross section of the North T deposit (Trueman and others, 1988).*

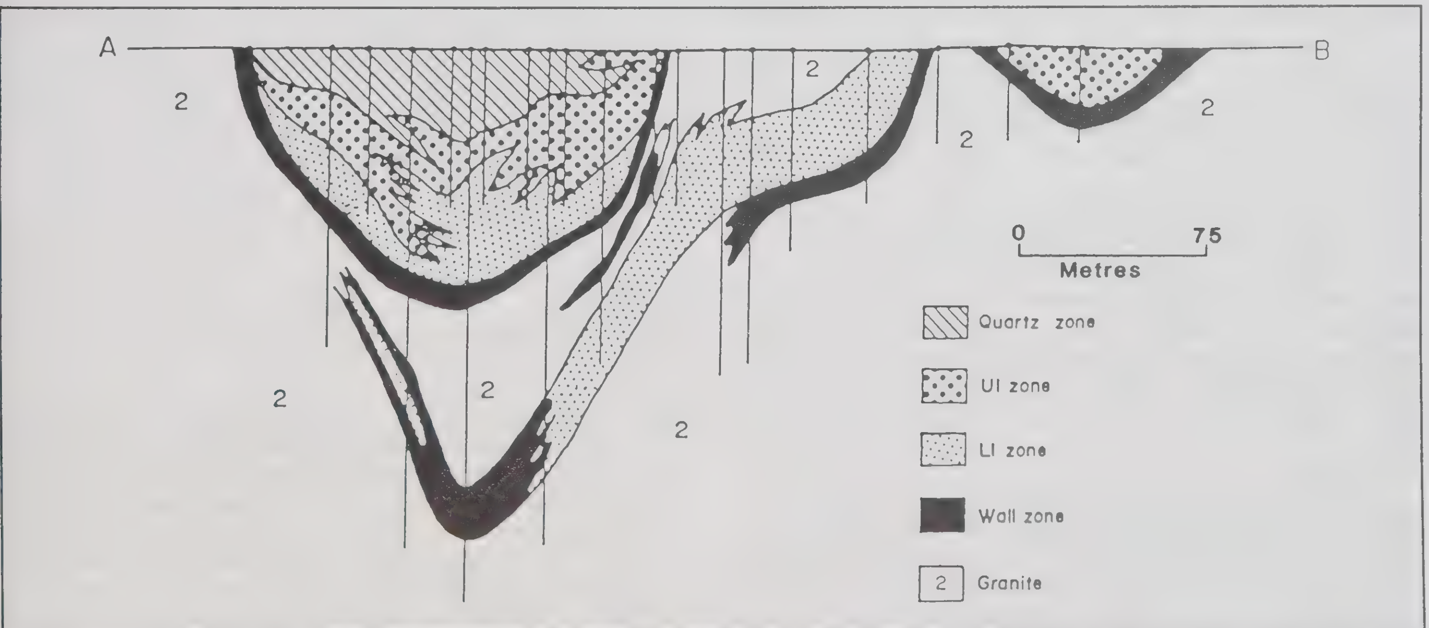


FIGURE 6-6b: *Geology of the T zone; longitudinal section A-B of the north T deposit (from Trueman and others, 1988).*

overburden, drilling and blasting to obtain surface samples for assay control and the delineation of the mineralized areas.

Selected samples were taken from the beryllium-zone drill cores for mineralogical studies of the yttrium and rare-earth minerals. These sections were assayed for gadolinium, neodymium, and samarium as well as niobium and gallium. From this work, values have averaged 0.21% yttrium, over 1.0% niobium, 0.1% neodymium, 0.06% gadolinium, 0.12% samarium, 0.05% gallium and 0.9% cerium and lanthanum. Individual assays of core were as high as 1.28% yttrium oxide and 4.75% niobium oxide over 3 m indicating a profound enrichment of these metals in the beryllium zones. About 120 km of ice road was built on Great Slave Lake between Yellowknife and Thor Lake, and some 500 t of mining equipment and supplies were moved to Thor Lake in preparation for the 1985 underground program.

The highlight of the 1985 work at Thor Lake was the underground program contracted to Strathcona Mineral Services Ltd. of Toronto. A 500 m long decline was driven to a depth of more than 80 m in the beryllium-, yttrium- and REE-rich North T Zone, primarily to provide a bulk sample of the various sub-zones for metallurgical testing, but also to verify and compare assay and berylometer results with drill results. A 90 t bulk sample of material mined in the beryllium zones was shipped to Lakefield Research Ltd. of Lakefield, Ontario by year end (Gibbins 1987).

Between September and early December of 1985, 22 additional holes (1822.5 m) were drilled in the deposits between September and early December of 1985.

Mineralogical studies were undertaken in the Geology Department, University of Alberta (Smith and de St. Jorre, 1985; de St. Jorre and Smith, 1988; de St. Jorre, 1986). Specifically, the studies are concerned with the identification and nature of the various yttrium-, REE-, niobium- and gallium-bearing minerals and their distribution within the beryllium deposits of the T Zone and their sub-units (Table 6-1).

TABLE 6-1: LITHOLOGIC UNITS OF THE T-DEPOSIT, BLATCHFORD LAKE COMPLEX

6	**Quartz Zone**
5	**Upper Intermediate Zone** 5A Quartz, Mica 5B Quartz, Mica, Feldspar 5C Quartz, Feldspar, ± Chlorite (5C/1, Brecciated Equivalents) 5D Quartz, Feldspar, Mica, Magnetite 5E Quartz, Bastnaesite 5F Quartz, Thorite, Feldspar
4	**Lower Intermediate Zone** 4A Quartz, Chlorite, Feldspar 4B Chlorite, Feldspar, Carbonate, ± Quartz 4C Quartz, Chlorite, Feldspar (Altered Granite) 4D Chlorite, Feldspar (Altered Syenite) 4E Quartz, Magnetite, Chlorite
3	**Wall Zone** 3A Breccia 3B Microclinite, Albitite 3C Banded Aplite, Albitite
2	**Granite** 2A Magnetite, Riebeckite 2B Fluorite 2C Berillian 2D Other
1	**Syenite**

TABLE 6-2: THOR LAKE SYENITE LITHOLOGIES, modified from Davidson (1978).

(1) "coarse- to medium-grained, dark green rusty weathering fayalite, pyroxene syenite;

(2) coarse-grained hornblende syenite;

(3) inequigranular hornblende syenite characterized by very coarse, highly poikititic hornblende;

(4) subporphyritic hornblende syenite;

(5) medium-grained hornblende syenite with aligned hornblende crystals"; and

(6) syenite pegmatite.

DESCRIPTION

The claims cover the central core of the Blatchford Lake Plutonic Complex known as the Thor Lake Syenite, a 30 km^2 oval in the centre of the Grace Lake Granite pluton (Figs. 6-4 and 6-5)(Davidson, 1978, 1982; Trueman *et al.*, 1984, 1988). Davidson (1978, p. 123) identified and mapped five varieties of syenite, based on textural and compositional differences. Trueman *et al.* (1988) added a sixth lithology, syenite pegmatite (Table 6-2).

An area of late stage veining, alteration and mineralization is centred on Thor Lake in the western part of the Thor Lake syenite (Fig. 6-5). This area contains five zones of Nb, Ta and REE enrichment along with high concentrations of Zr, Ga, Be, F and locally Y, Th and U. Patterns of element depletion and enrichment throughout the differentiated suite are consistent with the hypothesis that the observed alteration and mineralization are the end products of magmatic differentiation (Davidson, 1982).

Lake Zone

The Lake Zone is a 2 km^2 triangular-shaped area of dark, altered and brecciated rock beneath and south of Thor Lake (Fig. 6-5). It is the largest of the five mineralized zones and contains Nb, REE, Y and Zr. The Lake Zone has been subdivided into an outer Wall zone of pink to buff, massive, feldspar-rich rock and a central Core zone of brecciated diverse mineral types, mainly composed of albite, micas, quartz, magnetite and hematite (Fig. 6-5). The outer contact of the Wall zone with the enclosing Thor Lake Syenite is sharp, but the inner boundary is gradational with brecciated rock increasing toward the core (Trueman *et al.*, 1988). Pinckston and Smith (1988) recognized nepheline syenite in the Lake Zone. The nepheline syenite is in part altered, but is not enriched in incompatible elements and is believed to be a late stage intrusion.

Prior to 1988 drilling, 29 holes in the Lake Zone had outlined a resource of 65 Mt grading 0.03% Ta, 0.4% Nb, 1.7% combined REE and 3.5% Zr (Trueman *et al.*, 1988).

T Zone

The T Zone trends north-northwest away from the Lake Zone for approximately 1 km and varies in width up to 275 m (Fig. 6-5). It straddles the Grace Lake Granite-Thor Lake Syenite contact and offsets it (Fig. 6-6a). Trueman *et al.* (1988) recognized some 15 lithologies (Table 6-1), arranged as concentric to sub-horizontal shells, which can be grouped into four zones (Fig. 6-6).

The Wall zone, which mantles the T Zone, is a pink to buff weathering, massive unit of variable texture and mineralogy. As in the Lake Zone, the Wall zone is dominated by relict microcline, albite and minor quartz. Columbite is a common accessory mineral, and high gallium contents are associated with feldspars, substituting for trivalent aluminum (Trueman *et al.*, 1988; de St. Jorre and Smith, 1988).

The Lower Intermediate zone, comprising five lithologies (Table 6-1), contains beryllium in the mineral phenacite, and yttrium and rare-earth elements in an intimate admixture of a metamict species believed to be thorite. Niobium is in the mineral columbite, which formed in massive granular and radiating spicular aggregates.

The Upper Intermediate zone is transitional to the Lower Intermediate and Quartz zones, and is largely dominated by quartz-polylithionite-albite assemblages. It is an important host for beryllium, and less so for by-product yttrium, rare earths and niobium. Polylithionite is of interest for its lithium and rubidium content (Trueman *et al.*, 1988).

The Quartz zone occupies the core of the North T Zone and patchy areas of the south (Fig. 6-6). It is essentially monomineralic consisting of white and greyish translucent quartz.

A total of 124 drill holes in the T Zone has outlined 1.6 Mt grading 0.85% BeO, including 435 000 t of 1.4% BeO, 0.26% Y_2O_3, plus Nd, Sm, Gd, and Ga (Trueman *et al.*, 1988).

CURRENT WORK AND RESULTS

In 1986, Highwood Resources Ltd. completed the crushing and splitting of the bulk samples obtained from the 1985 underground operation. A 12 km road was built between the mine portal and the Hearne Channel on Great Slave Lake. Some 680 t of mineralized rock were shipped by winter road and rail to Lakefield Research for metallurgical testing.

Highwood Resources finalized an agreement with Hecla Mining Corporation in 1986, whereby Hecla Mining would conduct and finance the ongoing research and exploration of the Thor Lake deposits, and, pending the completion of a satisfactory feasibility study, arrange the necessary capital funding to bring the property into production.

A formal marketing study was commissioned in the fall of 1986 by Hecla Mining to quantify the markets for, and future growth of, beryllium and related by-products from Thor Lake. This study, which indicated there will be significant growth in consumption of beryllium (6% annually), was continued by the Highwood/Hecla joint venture in order to provide further confirmation of the data and to continue market development. The joint venture initiated talks with interested processors and consumers in the United States, Japan and Europe and investigated sales of concentrates, refined products and alloys.

In 1987, the Highwood Resources Ltd./Hecla Mining Co. joint venture continued metallurgical, feasibility and marketing studies. Beryllium hydroxide, produced from Thor Lake beryllium concentrate, was provided to potential customers. Environmental and geotechnical studies were also undertaken.

Mineralogical studies of the T Zone (de St. Jorre, 1986; de St. Jorre and Smith 1988) and the Lake Zone (Pinckston and Smith, 1988) at the University of Alberta continued to identify beryllium- and REE-bearing minerals and their distribution.

PGM CLAIMS

Highwood Resources Ltd.	Platinum Group Elements
12th Floor, 20 Toronto St.	85 I/2
Toronto, Ont., M5C 2B8	62°06'N, 112°48'W

REFERENCES

Davidson (1972, 1978, 1982); Pinckston and Smith (1988).

PROPERTY

PGM 1-6.

LOCATION

The claims are east and northeast of Francois Bay, north shore of Hearne Channel about 100 km southeast of Yellowknife. The area is centred near the south end of Caribou Lake and extends from the Hearne Channel to Whiteman Lake.

The claims include the Caribou Lake gabbro (Fig. 6-4).

HISTORY

The claims were recorded in January 1987.

DESCRIPTION

The Caribou Lake gabbro, which underlies the claims, is exposed only on the western side of the Blatchford Lake alkaline complex (Davidson, 1972, 1978, 1982)(Fig. 6-4). It is intruded by younger units of the Blatchford Lake Intrusive Suite to the east, whose emplacement has removed much of what must have been a considerably larger pluton. It varies in lithology from olivine gabbro to leuco-ferrodiorite, and includes chilled, pegmatitic, noritic and anorthositic phases. Pinckston and Smith (1988) also reported pyroxenites and previously unreported anorthosites in the Caribou Lake gabbro.

CURRENT WORK AND RESULTS

In 1987, Highwood personnel prospected and sampled phases of the Caribou Lake gabbro for platinum group elements.

TALTSON MAGMATIC ZONE

The Taltson Magmatic Zone (Fig. 6-2) is a belt of granitic to dioritic plutons that extends southward along the edge of the exposed Precambrian Shield (Bostock *et al.*, 1987). These plutons have been dated between 1.93 and 1.92 Ga from zircon and monazite using U-Pb methods. Like the Thelon Magmatic Zone, the belt contains magnetite and ilmenite series plutons that produce positive and negative magnetic anomalies respectively. A transition zone of north-trending sinistral shear zones (Culshaw, 1984; Bostock *et al.*, 1987) separates the magmatic zone and Archean rocks. The Archean rocks are overlain to the east by sinistral pull-apart basins (Nonacho Group). Metamorphic grade of the Archean rocks is significantly lower than in the Queen Maud uplift (Bostock *et al.*, 1987).

RUTLEDGE LAKE PROJECT

Enexco International Ltd.
P.O. Box 12508
1120, 1066 W. Hastings St.
Vancouver, B.C., V6E 2E6

Copper, Nickel, PGEs
75 E/7,10,15
61°37'N, 110°47'W

REFERENCES

Bostock (1988); Bostock *et al.* (1987); Culshaw (1984a,b); Fyson (1985); Gibbins (1985).

DIAND assessment reports: 082098 (1986), 082489 (1987).

PROPERTY

LEA 1-20, ENEX 1-10, WWK 1-12.

LOCATION

The claims are centred on and include most of Rutledge Lake and adjacent shorelines. Rutledge Lake is about 200 km southeast of Yellowknife and 180 km north-northeast of Fort Smith (Fig. 6-1).

HISTORY

Mr. W.W. Kizan and Mr. Lloyd Anderson first prospected at Rutledge Lake in 1980 after having sighted gossans from the air during flights across the lake. In late 1980 Mr. Kizan brought rock and mineral specimens to Trigg Woollett Consulting Ltd.'s office where they were determined to be of volcanic origin.

In September 1981, Trigg Woollett Consulting Ltd. geologists spent several days in the Rutledge Lake area trying to define the margins of the belt. Mapping showed the belt to be at least 60 km long, tapering rapidly at the north and south ends. The maximum width of the belt is 17.5 km. More than 70 gossans and 41 sulphide mineral showings were identified during the reconnaissance mapping; about 75% of these are within the belt of intermediate rocks. Only three of the sulphide showings were examined in detail. The LEA 1-20 claims were staked in the fall of 1981.

During 1982, prospectors Kizan and Anderson continued to prospect the area. They collected numerous samples that returned low but interesting assays for copper, nickel, cobalt, molybdenum, lead, gold and silver.

Questor Surveys Ltd. flew 2211.5 km of Standard Mark IV INPUT-EM and magnetic survey over the Rutledge Lake area in July and August, 1983 (Gibbins, 1985). Twelve class 1, nineteen class 2 and five class 3 conductive-magnetic zones were outlined; four (43 C, 62 G, 86 B and 146 C) were recommended for immediate attention. Two areas of conductive lake bottom sediments were identified; they are very distinctive and not common in the area.

Trigg Woollett Consulting Ltd. prospected, cut grid lines, mapped, did VLF EM and magnetic surveys and collected soil and rock chip samples from five priority INPUT-EM/magnetic targets.

Paterson, Grant and Watson Ltd. was contracted to synthesize and re-interpret the 1983 geophysical work. The raw aeromagnetic data was modified to produce apparent magnetic susceptibility maps by calculating the magnetic susceptibility distribution in the ground that would be required to produce a total magnetic field contour map identical to the one measured. On this map the regional gradient is effectively removed and a measure of the local susceptibility is provided. The magnetic susceptibility map formed the basis of a new geological interpretation which is similar regionally but markedly different in detail than the Trigg Woollett map.

The Paterson, Grant and Watson Ltd. interpretation recognized three principal magnetic terrains, consisting of low, intermediate and high magnetic relief. They also recognized 81 single or multiple INPUT conductors and observed that the magnetic susceptibility anomalies are confined, both along strike and laterally, to the regions of highest conductivity.

Five priority ratings (A, A-, B, B- and C) were assigned to the 81 INPUT conductors. These ratings, along with other factors such as size, shape, geological environment and accessibility, were used to select conductors for further work. Paterson, Grant and Watson Ltd. suggested that ground EM using horizontal loop (i.e., Max-Min) is preferable to VLF EM, because widespread pyrrhotite will make it important to find the main axis of the airborne conductor.

The WWK 1-2 were recorded in January 1983 and the ENEX 1-10 claims in October 1983 to protect INPUT conductors outside the LEA claims.

DESCRIPTION

The Rutledge Lake area is near the eastern edge of the Taltson Magmatic Zone (Fig. 6-2)(Bostock *et al.*, 1987). Rutledge Lake is underlain by a north-trending belt of granite gneiss and paragneiss (unit 1 of Culshaw, 1984a,b, Fig. 6-7; and unit 2 of Bostock, 1988). Culshaw referred to this belt as the Rutledge Lake Complex. It is intruded by a 4 by 1.5 km oval body of charnockite (hypersthene granite) near the north end of Rutledge Lake.

Fine- to medium-grained bands and lenses of mafic to ultramafic rocks are in the paragneisses and within and along the margins of the charnockite (Fyson, 1985). In many of these lenses (units 7 and 8 in Fig. 6-7) there are small rusty zones of sulphides, mainly pyrrhotite and chalcopyrite, with anomalous amounts of copper, nickel and precious metals.

Trigg Woollett Olson Consulting Ltd. determined that the mafic to ultramafic rocks from Rutledge Lake comprise pyroxenite, anorthosite, peridotite, olivine gabbro and minor amounts of serpentinite. Elevated platinum, palladium and gold contents are associated with pyroxenite or peridotite and are not always directly associated with sulphide minerals. The genesis of these rocks is unclear, but is possibly related to peridotitic magmatism associated with intracratonic rifting along the Thelon Tectonic Zone and analogous to the Thompson Nickel Belt (DIAND assessment report 082489).

CURRENT WORK AND RESULTS

During August to September 1986 and April to March 1987, Trigg Woollett Olson Consulting Ltd. did detailed geological mapping and Paterson, Grant and Watson Ltd. did nearly 200 line-km of magnetometer and EM surveys on grids covering 24 INPUT conductors (Fig. 6-8)(DIAND assessment reports: 082098, 082489). At the same time 28 holes, totalling 2500 m, were drilled to test many of these INPUT conductors.

1986

Thirteen INPUT conductors were explored in 1986. INPUT conductors chosen for 1986 work were determined by the need to satisfy assessment requirements. Ground magnetometer and Turam EM surveys successfully delineated eight of the airborne INPUT anomalies.

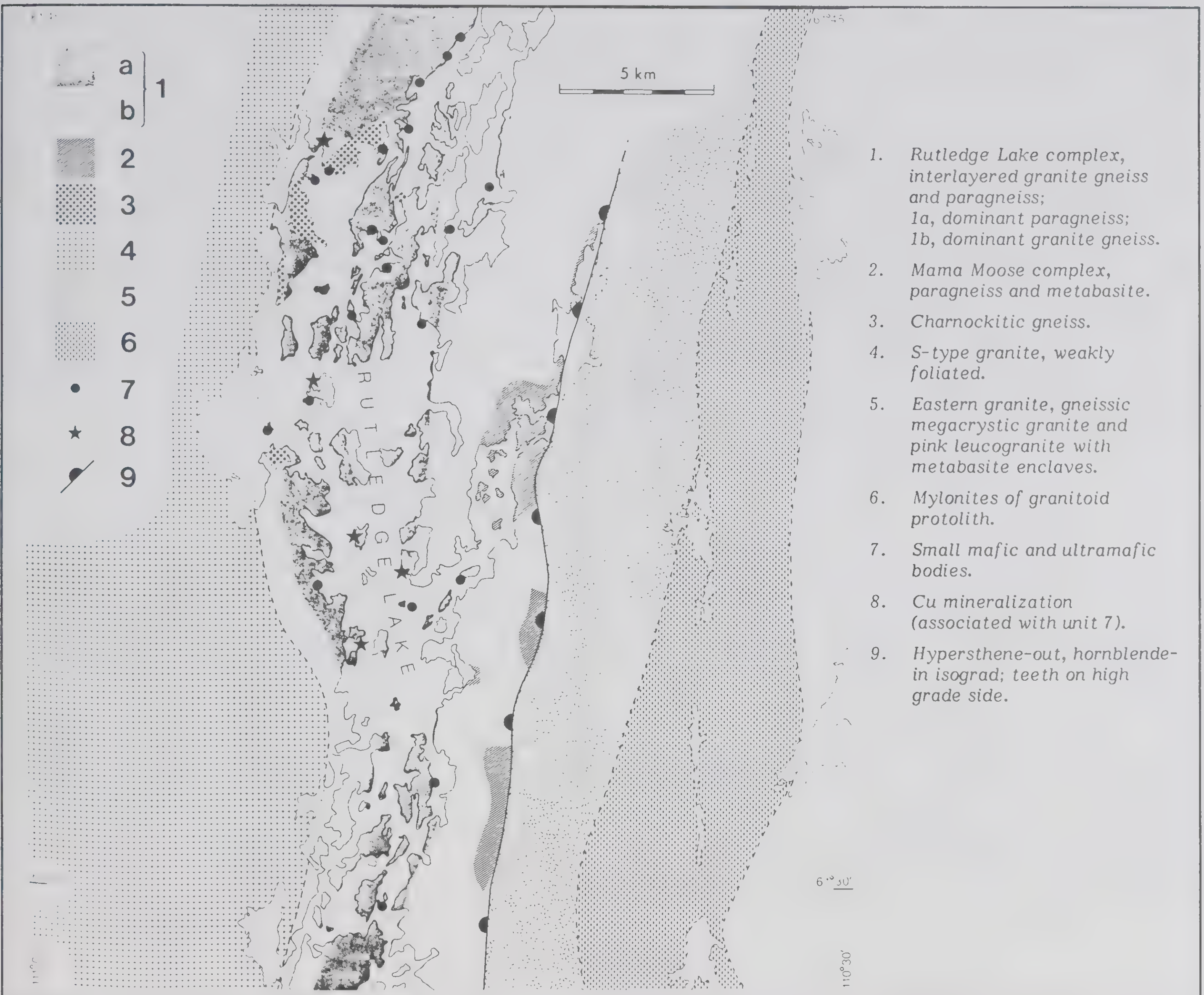


FIGURE 6-7: *Geology of the Rutledge Lake area, from Culshaw, 1984a. The boundary between units 1 and 4 is gradational. The boundaries of unit 6 were derived from air photo interpretation.*

Nineteen holes (1135.5 m) were drilled in twelve INPUT conductors; sulphide minerals were intersected (Fig. 6-8A). Sulphide content ranges from 1% to 55% by volume. The sulphide zones, up to 30.81 m wide (apparent width), have been intersected at depths up to 55 m. Samples from the 15 drill holes contain up to 0.70% Cu, 0.83% Ni, 55.2 ppm Ag, 320 ppb Au, 1250 ppb Pt and 230 ppb Pd. In this report, concentrations of 0.09% Cu, 0.09% Ni, 30 ppb Au, 50 ppb Pt, and 5 ppb Pd are used to distinguish between low and elevated levels of these elements. Elevated concentrations of one or more of these metals were found across core lengths of 1 to 3 m. Elevated concentrations of silver, gold, platinum and palladium are primarily within sulphide breccia or massive sulphide that is associated with pyroxene, chlorite, plagioclase or dark quartz.

1987

During spring 1987 one or more of ground magnetometer, pulse EM and DEEP EM surveys were carried out at 13 INPUT conductors. The ground geophysical surveys delineated the airborne INPUT and airborne magnetic conductors.

Nine holes (1365.2 m) were drilled in eight INPUT conductors (Fig. 6-8B). Core samples from the nine holes, which were drilled during spring 1987, contain up to 1600 ppm Cu across 0.10 m core length, 2000 ppm Ni across 0.11 m core length, 135 ppb Au across 0.11 m core length, 50 ppb Pt across 1.70 m core length and 55 ppb Pd across 0.11 m core length. These anomalous concentrations of metals are primarily within mafic rock comprising one or more of pyroxene, chlorite, plagioclase, dark quartz and sulphides.

As of June 30, 1987 Enexco International Ltd. and associated companies retained the following claims in good standing: LEA 1-17, 20; ENEX 3-5, 7; and WKK 1-5, 9, 10 12, encompassing 28 000 ha.

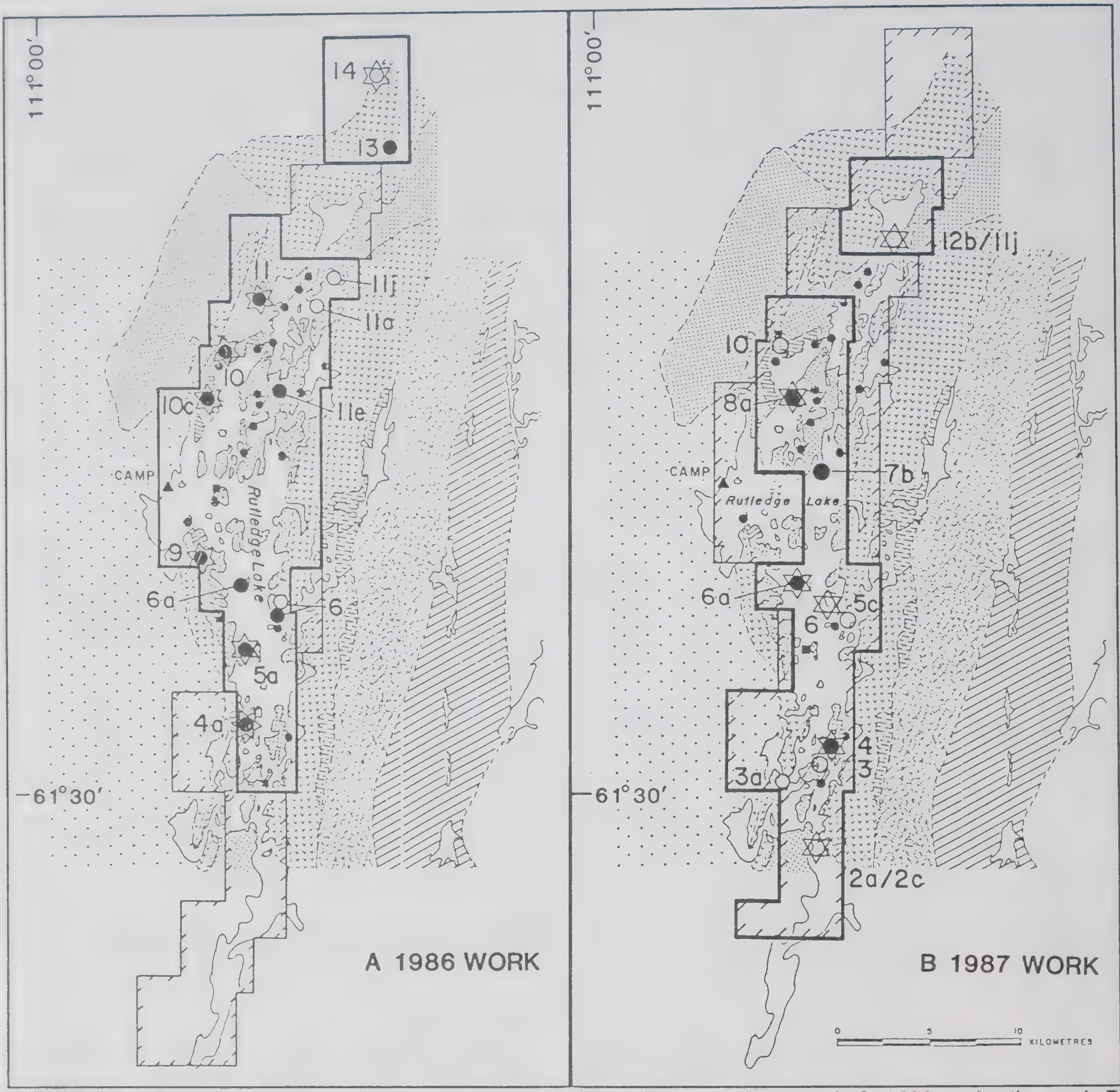


FIGURE 6-8: Rutledge Lake mineral claims showing INPUT conductors and areas of: ***A****, 1986 exploration and;* ***B****, 1987 exploration.*

SOUTHERN RAE PROVINCE

The Rae Province (Fig. 6-2) is an Archean granite-greenstone-gneiss-granulite terrane (Hoffman, 1988a). It is bounded on the west by younger rocks of the Taltson Magmatic Zone and separated from similar rocks of the Hearne Province on the southeast by the Snowbird tectonic zone.

ENNADAI PROJECT

Athabaska Gold Resources Ltd.	Gold
801, 850 W. Hastings St.	65 D/3,4
Vancouver, B.C., V6C 1E1	(64 M/13,14)
	60°N, 103°30'W

REFERENCES

Metcalfe (1987); Schreiner (1984); Taylor (1963).
DIAND assessment report: 082873.

PROPERTY

ENN 1-3, ESK 1-12, (HAT 1-3, in Saskatchewan).

LOCATION

The claims straddle the NWT-Saskatchewan border at latitude 103°30'W, about 15 km east of Striding Lake and

LEGEND

ARCHEAN

Rutledge Lake Complex

- Paragneiss. Migmatitic pelitic gneiss, quartzite and quartz-feldspar metawacke
- Granite gneiss and orthogneiss. Léucocratic gneiss of granite or granodiorite composition

Mama Moose Complex.
Strongly magnetic paragneiss and metabasite

Chamockitic Gneiss.
Hypersthene-bearing granodiorite-tonalite gneiss

Western granite

Eastern granite

Mylonites

SYMBOLS

6a○ INPUT conductor at which exploration was performed during 1986: identifier

● INPUT conductor at which 1986 drilling intersected greater than 5% sulphides

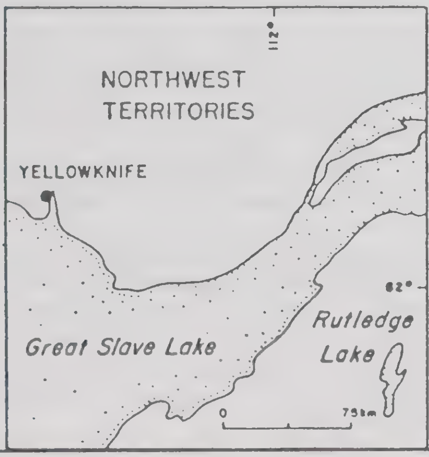
☆ INPUT conductor at which 1986 drilling intersected elevated concentrations of one or more of copper, nickel, gold, silver, platinum or palladium

Boundary of mineral claims held by Enexco International Limited or its associated companies

Boundary of mineral claims (LEA 1 to LEA 17, LEA 20, ENEX 3 to ENEX 5, ENEX 7) where assessment work was performed during 1986

• Small mafic and ultramafic bodies

▪ Copper mineralization; associated with small mafic and ultramafic bodies (Culshaw, 1984)



15 km southwest of Atzinging Lake.

The area is 650 km east-southeast of Yellowknife and 475 km east of Fort Smith. The nearest communities are Stony Rapids 150 km to the southwest, and Points North 150 km to the south in Saskatchewan.

HISTORY

The Ennadai project comprises 18 contiguous claims (25 551 ha) along the border of northeastern Saskatchewan and south-central NWT (southeast District of Mackenzie). The claims were recorded in August 1987 for precious and base metal potential.

Extensive work was conducted on the Saskatchewan side of the border from 1984 to 1986 by Saskatchewan Mining Development Corporation (SMDC, now CAMECO) and in 1987 by East West Resource Corporation on permits now covered by mineral claims HAT 1, HAT 2 and HAT 3.

Mapping by SMDC identified a broad belt of mafic to intermediate metavolcanics which grades through a transition zone into turbidite metasediments. Geophysical and geochemical surveys outlined both oxide-facies and sulphide-facies iron formation, some containing anomalous amounts of gold. The most significant discovery, the Nirdac Creek zone, is a silicate/sulphide-facies iron formation boulder train. Samples from 20 boulders assayed between 3.43 and 26.40 g/t Au. Core from one hole, drilled at the apex of the boulder train, assayed 13.75 g/t Au over 1.5 m.

In 1987, East West Resources drilled six of seventeen diamond drill holes into the Nirdac Creek gold zone. Five of these intersected sulphide/silicate-facies banded iron formation. The best intersection assayed 9.26 g/t Au over 2.5 m (Metcalfe, 1987).

DESCRIPTION

The claims are near the southwestern-most end of the Archean Ennadai greenstone belt. Taylor (1963) divided this belt into three units: metasedimentary rocks, chiefly metagreywacke with some quartzite and minor iron formation; metavolcanic rocks, chiefly basalt and tuff; and intercalated metavolcanic and metasedimentary rocks. Gneissic granite and paragneiss lie to the northwest of the belt. Plutons ranging from granite to gabbro intruded the area.

A pervasive layer of Quaternary glacial till, sand, silt and gravel covers 95% of the Ennadai surface area. Streamlined land forms (eskers, drumlins, etc.) and rare glacial striae suggest a predominant ice movement from the northeast at about 30° (Schreiner, 1984). Glacial topography is dominated by glaciofluvial terrain (eskers, kames, kettles), hummocky moraines, moraine plains (till plains, fluted or drumlinized ground), organic terrain (muskeg) and more rarely by felsenmeer (Schreiner, 1984).

CURRENT WORK AND RESULTS

In 1987, 68 boulder and outcrop samples were collected and analyzed, but no anomalous gold concentrations were detected. A 30 by 100 m gossan in eastern ESK 6 produced samples ranging from 2 to 10% pyrite which were essentially devoid of gold and base metals.

HUB 1 CLAIM

W. A. Hubacheck Consultants Ltd.
Suite 603, 141 Adelaide St. W
Toronto, Ont., M5H 3L5

Gold, Silver
65 D/16
60°52'N, 102°06'45"W

Agnico-Eagle Mines Ltd.
2302, 401 Bay St.
P.O. Box 102
Toronto, Ont., M5H 2Y4

REFERENCES

Lord (1953); Taylor (1963).
DIAND assessment reports: 062077, 082652.

PROPERTY

HUB 1.

LOCATION

The HUB 1 claim is about 22 km north of Kasba Lake and 27 km east of the northern tip of Snowbird Lake. It covers the central part of a westerly trending greenstone belt, 3 km west of the end of a long irregular-shaped bay of northwestern Rochon Lake and 4 to 5 km west of the boundary between the districts of Keewatin and Mackenzie.

HISTORY

Canico Ltd. (Inco Ltd.) discovered an airborne EM anomaly and lens-shaped gossans in the area in 1953. The HUB claim area was held as TOP 4 and 5 by Rio Tinto in 1964. Four trenches were excavated in rusty, sheared mafic volcanics with numerous quartz stringers. The highest assay from the trenches was 11.7 ppm Au. Subsequent trenches may have been made by Gulf Minerals Canada Ltd. or Phelps Dodge Corp. who explored the Rochon Lake area for base metals from 1974 to 1978. The HUB 1 claim was staked by H. Vouri in July 1987.

DESCRIPTION

The claims are underlain by an easterly trending belt of metavolcanic rocks (Taylor, 1963). A 1 to 1.5 km wide conductive band of chloritic and amphibolitic schists dips 45 degrees to the north. Gold has been found in the same belt of volcanic rocks to the east at Ennadai Lake (Lord, 1953, p. 9).

CURRENT WORK AND RESULTS

In 1987, the HUB 1 claim was geologically mapped, and magnetometer and VLF EM surveys were done over a pace and compass grid. Several VLF EM anomalies roughly coincident with high magnetic values and gradients were discovered. VLF conductors just north of the base line reflect isoclinally folded sulphides within amphibolite-facies iron formation. Gold is hosted within stratabound sulphides which have undergone partial or complete mobilization into fold noses. Dilatant zones within noses of larger folds may have played a significant role in enrichment of stratabound sulphides to economic grades.

Lens-shaped gossans, 8 by 15 m, are at 10+85E and 17+80E. Sulphide minerals consist of disseminated grains and streaks of pyrite, pyrrhotite and rare chalcopyrite. Boudins of barren bull quartz up to 1 m long and 30 cm in width are localized in small-scale boudinage drag folds en-echelon with the gossans.

The most encouraging assay, 2.88 g/t Au, was from a felsenmeer.

THE GREAT SLAVE PLAIN

The Great Slave Plain is that part of the Interior Plains between latitudes 60° and 64°N and between the Franklin Mountains and the western edge of the Precambrian Shield in the vicinity of Great Slave Lake. It is underlain mainly by Paleozoic carbonates, evaporites and shales and has a relatively flat topographic surface, generally less than 300 m in elevation, that is characterized by sparse outcrop, abundant swamp, sink holes and karst topography. The Horn Plateau, which consists of Mesozoic strata, is a broad, smooth upland rising to 835 m in elevation.

The Great Slave Plain includes the Pine Point Lead-Zinc District, the source of a large proportion of the Northwest Territories' annual production of minerals from 1964 to 1987 (see Chapter 2). Because of extensive overburden, the flat-lying attitude of the host rocks and the nature of Pine Point type Pb-Zn deposits, exploration is mainly by IP surveys (Lajoie and Klein, 1979; Seigel *et al.*, 1968) and fence or grid drilling. Attempts to find deposits using rock and soil geochemistry, gravity and EM surveys have not been as cost effective. Most exploration work is done in the winter months when the widespread swamps and muskegs are frozen.

The geology and exploration philosophy has been discussed by several workers: Campbell (1967), Skall (1975), Rhodes *et al.* (1984), Carter (1983), Krebs and Macqueen (1984), Webb (1986), and Webb and Macqueen (1985). The geology of the area has been mapped and discussed by Douglas and Norris (1974) and Norris (1965).

CURRENT WORK AND RESULTS

1986

At Pine Point Mines Ltd., exploration expenditures in 1986 totalled $2.2 million compared with $4.3 million in 1985. An internally funded program budgeted at $2 million was replaced in May with a $2 million exploration program, funded largely by a flow-through share issue. This program continued until February 1987.

Exploration, mainly geophysical surveys and diamond drilling, was concentrated in the eastern part of the property where ore deposits were more likely to have low strip ratios and low dewatering costs. A large, low-grade mineralized structure containing a small ore-grade deposit was located. The structure lies stratigraphically below the normal ore-bearing horizon.

Drilling an area of known mineralized zone near the mill led to the definition of additional ore at the P-41 deposit. A small prismatic ore body of 140 600 t with grades of 8.0 % Zn and 2.2 % Pb was outlined.

1987

Exploration expenditures in 1987 totalled $2.0 million compared with $2.2 million in 1986. Geophysical surveys and diamond drilling were concentrated in the central and eastern parts of the property where any ore deposits found would be more likely to have lower strip ratios and lower dewatering costs. The program was unsuccessful in locating new ore.

No further exploration is planned for the Pine Point Lead-Zinc District.

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CHAPTER 7
BEAR STRUCTURAL PROVINCE

J.B. Seaton
District Geologist, Bear-Slave

INTRODUCTION

The geology of the Bear Structural Province (Fig. 7-1) has been summarized in several previous Mineral Industry Reports (Seaton, 1978, 1981, 1983a, 1984, 1985, 1987; Seaton and Hurdle, 1978). In this report no attempt is made to summarize the geology. Several Geological Survey of Canada and university thesis projects are in progress or have recently been completed covering parts of the Bear Province and it is anticipated that soon a drastically revised geological summary may be required.

The East Arm Subprovince, though geologically included with the Bear Province, is covered in Chapter 6 of this Mineral Industry Report.

References relating to individual property descriptions are listed separately in the appropriate sections. General information on the Bear Structural Province and detailed reports on mapping of specific areas of the Bear Province include those by: Allan and Cameron (1973); Badham (1972, 1976, 1978); Barager and Donaldson (1973); Bowring (1982); Campbell (1978, 1979); Campbell and Cecile (1975, 1976a,b,c, 1979); Cecile and Campbell (1977); Easton (1980); Fraser (1964, 1974); Fraser *et al.* (1972); Gibb (1978); Grasty and Richardson (1972); Grotzinger (1982); Grotzinger and Gall (1986); Grotzinger *et al.* (1987); Henderson, J.F. (1949); Hildebrand (1981, 1982, 1984); Hildebrand *et al.* (1984, 1987); Hildebrand and Roots (1985); Hoffman (1973, 1977, 1978, 1980a,b,c,); Hoffman and Bell (1975); Hoffman and Cecile (1974); Hoffman and Henderson (1972); Hoffman and Bell (1975); Hoffman and McGlynn (1977); Hoffman *et al.* (1970, 1977, 1978, 1980, 1984); Hoffman and Pelletier (1982); Kerans *et al.* (1981); Kidd (1933, 1936); Kindle (1972); King *et al.* (1986, 1987); Lang (1952); Lord (1941, 1942, 1951); Lord and Parsons (1952); Miller (1982); McGlynn (1957, 1971, 1974, 1975, 1976, 1977, 1980); McGlynn and Ross (1963); McGrath and Hildebrand (1984); Mursky (1963, 1973); Padgham *et al.* (1974); Reichenbach (1985); Shegelski and Murphy (1972); Shegelski and Thorpe (1972); Smith (1962, 1967); St-Onge and Hoffman (1980); St-Onge *et al.* (1984); Thompson and Ashton (1984); Thorpe (1970); Tirrul (1985); Tremblay (1971); Wilson and Lord (1942). This list is largely restricted to Geological Survey of Canada publications.

Two of the three properties reported below are underlain by rocks of the Helikian Muskox Intrusion or its Epworth or Akaitcho Group Aphebian wallrocks. One property is underlain by rocks of the McTavish Supergroup or plutonic rocks of the Great Bear Volcano-Plutonic Complex.

PROSPECTING PERMITS 1098, 1099

Central Electricity Generating	Uranium, Copper
Board Exploration (Canada) Ltd.	86 F/4
Suite 700, 635 8th Ave. SW	65°00-65°15'N
Calgary, Alta., T2P 3M3	117°30'-117°45'W

REFERENCES

Lord and Parsons (1952); Hildebrand and Roots (1985); Pelletier (1985); Reichenbach (1985).

DIAND assessment reports: 018860, 082150, 082733.

PROPERTY

Prospecting Permits 1098, 1099.

LOCATION

The permit areas are from 330 km to 355 km northwesterly of Yellowknife. Prospecting Permit 1098 covers 86 F/4 NE and includes part of Longtom Lake, and Prospecting Permit 1099 covers 86 F/4 SE and includes part of Zebulon Lake.

HISTORY

Previous work documented as assessment is limited to one incomplete report by Bel Can Explorations in 1968. The report, unfinished because of the author's death, refers to an airborne radiometric survey, results of which are not available.

Prospecting Permits 1098 and 1099 were granted to Central Electricity Generating Board Exploration Canada Ltd. (CEGBE) in February 1986 following reconnaissance, 1:1000 geological mapping, and prospecting in 1985, which resulted in the discovery of three uranium showings: the Damp, Maia and DW showings in the Longtom Lake area.

DESCRIPTION

Lord and Parsons (1952) mapped 86 F at 1:253 440; Lord mapped the Longtom Lake-Zebulon Lake area. Though more recent mapping has been conducted east of longitude 117°27'W (Pelletier, 1985) and west of 118°W (Hildebrand, 1985; Reichenbach, 1985), the intervening ground which includes Prospecting Permits 1098 and 1099 has not been remapped by the Geological Survey of Canada or DIAND-sponsored crews.

The permit areas are underlain mainly by granitoid rocks that commonly intrude andesitic volcanics, sediments and quartz-feldspar porphyries of extrusive and intrusive origin.

At the Damp uranium showing at Longtom Lake, a roof pendant of volcanics forms a synclinal structure flanked by quartz-monzonite.

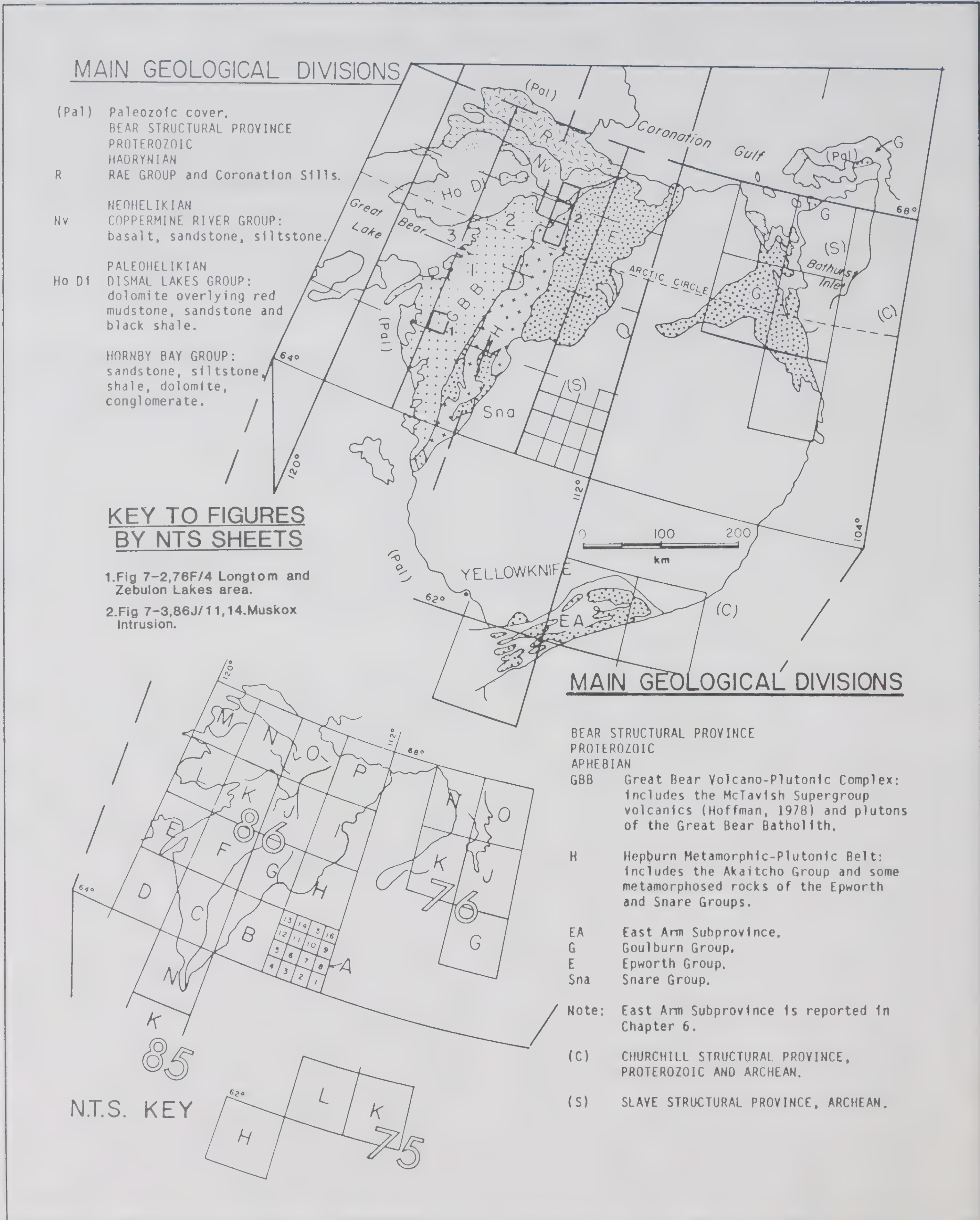

FIGURE 7-1: Geological subdivisions of the Bear Structural Province and locations of Figures 7-2 and 7-3.

CURRENT WORK AND RESULTS

In 1986 aeromagnetic anomaly target areas Z-1, Z-2 and Z-3 (Fig. 7-2) were prospected and geologically mapped at 1:10 000, 1:9200 and 1:15 000 respectively, and detailed surveys conducted at the Z-1 area, at and around the Damp and DW/Fog showings, where four grids were constructed: the Damp, DW/Fog, Seahorse and Seahorse-East grids (Fig. 7-2).

On the Damp grid work included: 1:1000 geological mapping, total field magnetometer vertical magnetic gradient, VLF EM, radiometric surveys, and soil sampling. A total of 248 soil samples collected from the Damp and DW/Fog grids were analysed for uranium, copper and silver. The Damp prospect was tested by ten trenches which were sampled and geologically mapped at 1:100 scale.

The Seahorse, Seahorse East and DW/Fog grids were explored by 1:1000 geological mapping, total field magnetometer vertical magnetic gradient and VLF EM surveys. Soil sampling was done on the DW/Fog Grid.

Encouraging results were obtained from the Damp prospect, a brecciated zone within a unit described as a rhyodacitic ashflow tuff. This breccia zone, which is strongly radioactive, is heavily albitised and veined by magnetite and hematite. Copper sulphides were found disseminated in albitised rock fragments and in veins. Botryoidal pitchblende was found in hematite-rich parts of the veins. Anomalous local concentrations of silver, zinc, cobalt, vanadium and lead are reported. The Damp prospect was outlined over a strike length of 300 m and an average width of 10-15 m. Results of VLF EM and soil sampling suggest that the Damp prospect may extend an additional 100 m southeasterly under overburden to Grouper Pond (Fig. 7-2). Best result from chip sampling was 0.95% U_3O_8 and 0.39% Cu across 6 m.

A linear west-northwesterly trending magnetic low was delineated in the southeastern part of the DW/Fog Grid and may be caused by a zone of albitisation and hematization of andesite beneath surficial deposits.

In 1987 an unsuccessful attempt was made to trench through overburden near Grouper Pond to test a VLF EM conductor. Alteration patterns, particularly sericitization at the eastern end of the Damp showing, were investigated.

Drilling subsequent to 1987 has revealed that encouraging surface concentrations of uranium do not persist in depth.

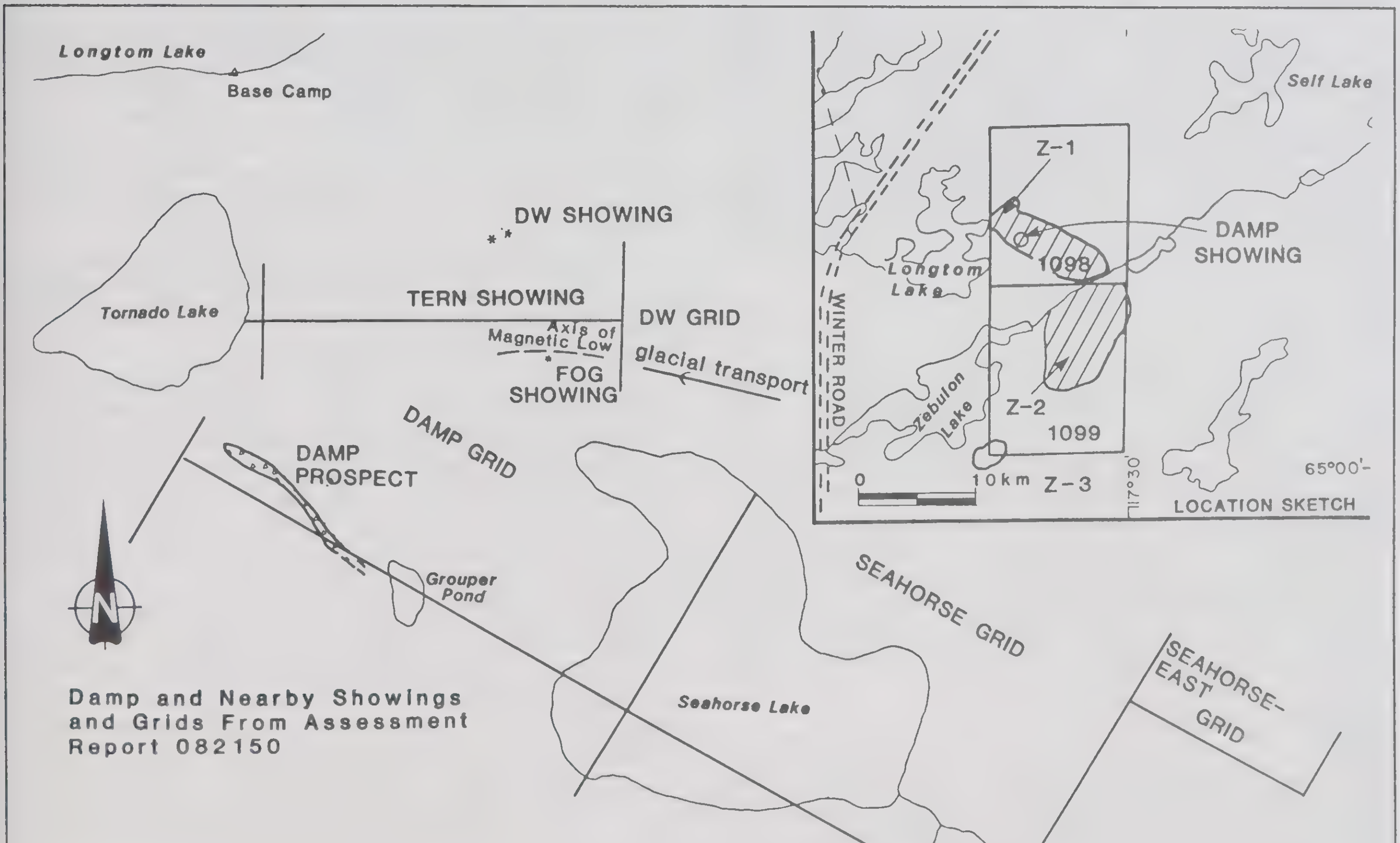

FIGURE 7-2: Prospecting Permits 1098 and 1099, the Damp and other showings.

MUSKOX PROPERTY

Equinox Resources Ltd.	Platinum Group Metals
500 576 Seymour St.	Copper, Nickel
Vancouver, B.C., V6B 2K1	86 J/11,14; 86 O/3
	66°42'-67°11'N
	115°06'-115°28'W

REFERENCES

Baragar and Donaldson (1973); Craig (1960); Craig *et al.* (1960); Findlay and Smith (1965); Hoffman (1980b, 1984); Irvine (1970, 1971); Sasaki (1969); Seaton (1984); Smith (1962, 1967).

DIAND assessment reports: 019171, 060469, 060470, 060471, 080765, 082562, 082563.

PROPERTY

Equinox Resources Ltd. claims: REEF 1-4; SPEE 4-13; REEF 1-4; RIM; VAL 1-7; YOKE 1-9.

Claims optioned to Equinox Resources Ltd. by B.P. Minerals Canada and others: B 1-3; U 7, 59.

LOCATION

The property lies from 475 km to 520 km north-northeasterly of Yellowknife and comprises two blocks of claims. The VAL and RIM claims form one block that extends from the Coppermine River to McGregor Lake. The other block, comprising the REEF, SPEE and YOKE claims, extends northwards from the vicinity of Speers Lake to west of Drill Lake. The two claim blocks are separated by International Platinum Corporation's OX 16-25 claims (Fig. 7-3).

HISTORY

The history of discovery, mapping, exploration and drilling of the Muskox Intrusion has been summarised under "OX claims" (p. 125 of this report).

The SPEE and VAL claims were recorded by Equinox Resources Ltd. in April 1986, the REEF and RIM in August 1986 and the YOKE claims in September 1986.

B 1-3 were recorded in April 1979 by B.P. Minerals Ltd. U 7 and U 59 were recorded by Union Carbide Canada Ltd. in April and October 1979 respectively. B.P. Minerals and Union Carbide Canada were partners in the Hornby Bay Project which explored the B, U and other claims for uranium (Seaton, 1984).

DESCRIPTION

The central layered complex and marginal phases, exclusive of the feeder dyke, is exposed for more than 50 km northward from the Coppermine River. The feeder dyke has been traced roughly 55 km south-southeasterly from the Coppermine River. The bulk of the intrusion is a gently northerly inclined layered ultramafic-mafic complex capped by granophyric rocks. The feeder dyke is mainly bronzite gabbro with minor amounts of olivine-rich rock. The complex has been eroded to progressively deeper levels southwards.

Marginal rocks of the Muskox Intrusion include olivine-rich units and a thin unit of bronzite gabbro near the contact. These units dip inward towards the axis of the intrusion, at about 30° (Smith *et al.*, 1967).

The geology of the Muskox Intrusion is described in more detail under the "OX claims" section (p. 125 of this report).

CURRENT WORK AND RESULTS

In 1986 work started in early August and comprised prospecting, rock, soil and silt sampling, diamond drilling and geophysical surveying.

Work commenced on the SPEE claims where the Muskox Reef (a thin chromite layer with which sulphide-rich layers are associated) was prospected and traced across the property. Prospecting was extended throughout the SPEE claims and another sulphide zone was discovered. A grid was constructed over this zone and explored by soil sampling (Fig. 7-3).

On the VAL claims roughly 15 km of the margins on each side of the intrusion were prospected, with a sampling interval of several hundred metres. In addition, where gossans cap massive sulphides at intervals along the margins, detailed sampling was done. Several of these areas were drilled by the Canadian Nickel Company in 1959 and 1960. Soil sampling as follow-up to this work was done concurrently with geophysical surveys in the fall following diamond drilling.

During 1986, 489 rock samples, 184 soil samples and 16 silt samples were collected. All samples were analysed for platinum and palladium and most for gold, and by 30 element I.C.P. analysis (Mo, Cu, PG, Zn, Ag, Ni, Co, Mn, Fe, As, U, Au, Th, Sr, Cd, Sb, Bi, V, Ca, P, La, Cr, Mg, Ba, Ti, B, Al, Na, K, W). Highly anomalous samples were checked by neutron activation analysis for gold, platinum, palladium, rhodium, ruthenium, iridium and osmium.

A diamond drill program commenced in late August, 1986. Seven holes totalling 1159 m were drilled. The longest hole was 280 m. One hole was abandoned at a depth of 170 m when the rods froze in the hole.

The holes were all drilled on the SPEE claim group (Fig. 7-3) and holes 86-1 to 86-4 were sited so as to explore the Muskox Reef and underlying chromitite, or chromite- and/or sulphide-bearing seams in the upper layered series of gabbro, pyroxenite and feldspathic peridotite. Thin chromite seams are commonly found hosted by websterite near its contact with feldspathic peridotite or gabbro which less commonly hosts chromite-rich seams.

Holes 86-1 to 86-4 intersected the Muskox Reef as intended. Anomalous concentrations of platinum and palladium were found to be hosted by serpentinized peridotite with interstitial chalcopyrite (Hole 86-3), feldspathic peridotite (Hole 86-1), serpentinite that hosts a 1 cm wide chromite seam (Hole 86-5), serpentinized feldspathic peridotite, troctolitic peridotite, serpentinized dunite and olivine gabbro (Hole 86-6) and chalcopyrite-bearing serpentinized peridotite (Hole 86-7). The highest assays were from Hole 86-3 where 3 m of core assayed 317 ppb Pt and 801 ppb Pd.

After demobilisation of the summer program, a fall program was commenced, prompted by encouraging platinum group metal assays from rock samples taken at the end of the summer. A camp was not re-established on the property, but personnel commuted from Coppermine by helicopter. Snow and bad weather hampered the fall program.

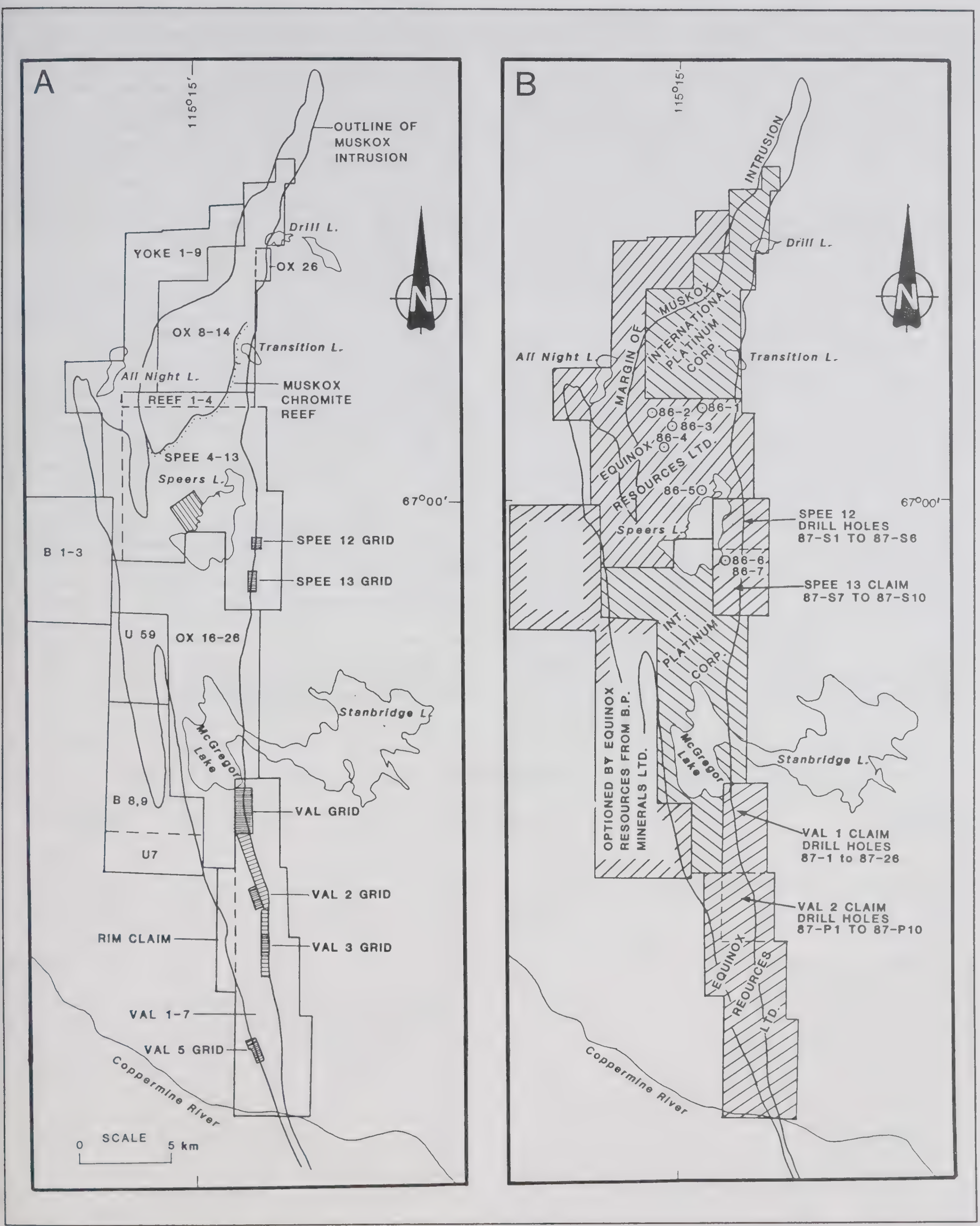

FIGURE 7-3: *Properties and grids covering the Muskox Intrusion.*

The fall program was designed to evaluate geologically and geochemically areas with anomalous platinum and palladium contents; to test the efficacy of soil sampling as an exploration tool at these sites; to outline massive sulphide zones near surface along the eastern margin of the Muskox Intrusion using a Geonics EM-38 soil inductivity instrument and a magnetometer, complemented by soil sampling to test for associated platinum group metals; and lastly to explore for deeper conductors along the lower contact of the Muskox Intrusion near its eastern margin using VLF EM (Fig. 7-3).

Soil sampling and stream sediment sampling proved generally ineffective in areas underlain by the central layered sequence of the Muskox Intrusion. Soil sampling of the gossanous soils at the intrusion margins however reflected results from rock sampling, though palladium was enhanced relative to platinum in soils, compared with the higher Pt:Pd ratios of rock samples from the same site.

Several VLF EM anomalies sub-parallel to the eastern margin of the Muskox Intrusion were delineated on a grid extending 10 km south of McGregor Lake (Fig. 7-3). The EM-38 survey outlined several strongly conductive zones along the eastern margins of the intrusion but gave no response over most known sulphide-mineralised zones. Magnetometer surveys were curtailed due to instrument malfunction.

Though surface samples from the vicinity of the Muskox Reef were locally highly anomalous, up to 1449 ppb Pt and 2054 ppb Pd 1.2% copper and 0.5% nickel, and samples from drill core assayed up to 152 ppb Pt, 444 ppb Pd across 0.75 m, the highest assays were obtained from massive sulphide zones at the lower contact of the Muskox Intrusion near its eastern margin. A strong positive correlation between the concentration of chalcopyrite and platinum group metals was noted. A 1 m intersection of peridotite with intercumulate chalcopyrite below the Muskox Reef assayed 381 ppb Pt and 669 ppb Pd, and much higher assays from the marginal sulphide zones show a similar association of platinum, palladium, copper and also gold.

In June 1987 a camp was established on the southwestern shore of McGregor Lake. Work was focused on the margins of the Muskox Intrusion and comprised prospecting, rock and soil sampling, geophysical surveys (EM-34, MaxMin II EM, magnetometer and IP), trenching and diamond drilling. During the last two weeks a second drill was brought to the property.

Six grids were constructed (Fig. 7-3) and explored as shown in Table 7-1. In addition to grid surveys, the VAL and RIM claims were explored by regional prospecting of the entire intrusion contact between the Coppermine River and McGregor Lake with the main objective of finding platinum group metal concentrations similar to those found on the grids. Work included rock and frost boil sampling and additional soil sampling of geochemical anomalies.

Diamond drilling comprised: 213 m in 6 holes on Spee 12 grid; 475 m in 4 holes on Spee 13 grid; 1022 m in 26 holes on Val 1 grid; 1498 m in 10 holes on Val 2 grid. Drill targets included selected conductors delineated by horizontal loop EM on the Spee 12, Val 1 and Val 2 grids.

Highly anomalous concentrations of silver are locally present as for example in drill core from the Val 2 grid where 3.34 m of core from hole 87.P5 averages 78.40 ppm Ag. In this case the silver is accompanied by highly anomalous concentrations of copper, nickel, platinum, palladium and gold. On the Val 3 grid however the only anomalous rock sample assay from numerous samples of massive pyrrhotite collected was for silver (40.9 ppm) alone.

On the Val 5 grid highly anomalous silver concentrations in rock samples locally accompany anomalous platinum, palladium, several percent copper and up to 0.5% Ni.

Though exploration of the Muskox Intrusion has shown local spectacular concentrations of platinum group and other metals in rock samples and drill core (Table 7-2), as yet substantial tonnages have not been found. The possibility for such tonnages has by no means been eliminated, and deep penetration EM techniques will likely be used to probe more deeply the footwall of the Muskox Intrusion.

TABLE 7-1: MUSKOX PROJECT - WORK PERFORMED IN 1987, BY GRID AND CLAIM AREA

Grid/Area CLAIMS	SPEE 12	SPEE 13	VAL 1	VAL 2	VAL 3	VAL 5	SOUTHERN VAL
Geological Mapping 1:2500	X	X	X	X	X	X	
Rock Sampling	X	X	X	X	X	X	X
Soil Sampling	X	X	X	X	X	X	X
Apparent Conductivity (EM-34-3)		X	X	X	X	X	
Magnetometer	X		X	X			
HLEM (Maxmin II)	X	X	X	X			
IP (App. Resistivity)			X				
IP (App. Chargeability)			X				
Trenching	1 trench		2 trenches				
Mapping 1:50 and Trench Sampling			X X				
Diamond Drilling	6 holes	4 holes	26 holes	10 holes			

TABLE 7-2: ASSAY RANGES FOR ANOMALOUS ROCK AND DRILL CORE SAMPLES

	ROCK SAMPLES			DRILL CORE	
Grid	Number of Samples	Element	Range	Number of Samples	Range
SPEE 12	9	Pt ppb	380- 2,035		No anomalous intersections
		Pd ppb	2,113-11,960		
		Au ppm	<2-2		
		Cu %	0.89-10.0		
		Ni %	0.06- 1.19		
SPEE 13	5	Pt ppb	228- 2,550	2	1,944/0.70m- 5,572/0.40m
		Pd ppb	125- 5,480		38,450/0.70m-52,920/0.40m
		Au ppm	<2-5		5/0.40m- 6/0.70m
		Cu %	0.45- 3.50		0.22/0.40m- 1.18/0.70m
		Ni %	0.06- 0.38		3.79/0.40m- 3.88/0.70m
VAL 1	13	Pt ppb	87- 5,583	8	94/1.53m- 962/1.27m
		Pd ppb	1,720-39,429		618/1.59m- 4,950/1.59m
		Au ppm	<2		<2
		Cu %	0.30- 8.68		0.40/1.53m- 6.03/0.67m
		Ni %			0.13/1.59m- 1.77/1.67m
VAL 2		Pt ppb	All <1000 ppb	9	52/0.70m- 2,228/1.71m
		Pd ppb	combined Pt and Pd		1,118/0.66m-16,044/1.71m
		Au ppm	<2		<2
		Cu %	- 7.45max.		0.67/0.66m- 22.90/1.71m
		Ni %	- 2.10max.		0.26/1.88m- 8.15/1.71m

OX CLAIMS

International Platinum Corporation
2304 Sun Life Tower
Box 30, 150 King St. W
Toronto, Ont., M5H 1J9

Platinum Group Metals, Copper, Nickel
86 J/14; 86 O/3
66°49'-67°11'N
115°08'-115°21'W

REFERENCES

Baragar and Donaldson (1973); Craig (1960); Craig *et al.* (1960); Findlay and Smith (1965); Hoffman (1980b, 1984); Irvine (1970, 1971); Sasaki (1969); Smith (1962, 1967).

DIAND assessment reports: 019171, 060469, 060470, 060471, 080765, 082562, 082563, 082590.

PROPERTY

OX 8-14, 16-26.

LOCATION

The area, which comprises two discrete blocks of claims (Fig. 7-3) is centred at Speers Lake, roughly 505 km north-northwesterly of Yellowknife.

HISTORY

H. Vuori of Canadian Nickel Company Ltd. (a subsidiary of the International Nickel Company of Canada Ltd., which in 1976 became Inco Ltd.) discovered the Muskox Intrusion in 1956.

The Muskox Intrusion was mapped by C.H. Smith of the Geological Survey of Canada in 1959 and 1960 (Smith, 1962). The surrounding area was mapped on a reconnaissance scale of 1:506 880 by Craig and others in 1959 (Craig *et al.*, 1960). Craig (1960) also mapped the surficial geology of the mainland from 65°N to 70°N and 112°W to 124°W. Mapping by Smith was revised by Smith, Irvine and Findlay in 1963, and the resultant maps 1213A and 1213B were published at a scale of 1:63 680 in 1967 (Smith, 1967).

Since its discovery the Muskox Intrusion has attracted much attention to its copper, nickel and platinum group metals potential. Canadian Nickel Company staked virtually the whole of the intrusion and drilled numerous holes (65 are plotted on Map 1213A) mostly along the gossanous margins of the Muskox Intrusion, from 1957 to 1959 (GSC Map 1213A). Regrettably no record of most of this work is publicly available. Evidently almost no assessment work was submitted or has survived. Only one report (DIAND assessment report 080785) comprising four drill hole logs has been found.

In 1963 the Muskox Drilling Project (Canadian Contribution to the International Upper Mantle Project No. 40) commenced. Three diamond drill holes, totalling 3075 m, the deepest of which reached 1220 m, were completed at and north of Speers Lake (Findlay and Smith, 1965). The Muskox Drilling Project concentrated on the axial layered part of the intrusion (GSC Map 1213A).

By the late 1960's most of Canadian Nickel Company's claims had lapsed.

In 1969 and 1970 Trans-Canada Resources Ltd. flew a helicopter-borne EM and magnetometer survey over areas west and south of McGregor Lake, and geologically mapped parts of the eastern and western margins of the Muskox Intrusion on their TOC and OXO claim groups (DIAND assessment reports: 060469, 060470, 060471, 019171).

In 1977 BP Minerals Ltd. and Union Carbide, while exploring for uranium on extensive claim blocks to the immediate west of the Muskox Intrusion, briefly prospected the chromite reef which outcrops sparingly north of Speers Lake.

After 1977 little or no exploration was done on the Muskox Intrusion until an upsurge in the price of platinum attracted exploration interest to the Muskox Intrusion in 1986, when International Platinum Corporation (then Silver Lake Resources Inc.) and Equinox Resources Ltd. each staked large areas.

International Platinum Corporation's property comprises: OX 8-14, recorded in June 1986; OX 16-25, recorded in April 1986; and OX 26, recorded in August 1986. OX 26 with OX 8-14 constitute the northern block of claims; OX 16-25 are 7 km to the south. Ground between the two blocks was staked by Equinox Resources in 1986.

DESCRIPTION

The layered and keeled Muskox Intrusion comprises olivine-rich units, pyroxenitic units, gabbroic units and granophyric units (Smith, 1967). A chromitite layer 20-40 cm thick is present in the upper part of the complex roughly 4.5 m above the base of a pyroxenite layer (Smith, 1962). Several copper-nickel showings have been mapped in wall rocks within 100 m of the margin of the Muskox Intrusion (Smith, 1967). Most of the showings are coincident with conspicuous gossans that in some cases cap massive pyrrhotite only. The copper-nickel showings have been tested by drill holes collared in the intrusion so as to test marginal olivine-rich units and gabbroic units which slope inward towards the axis of the intrusion, and the footwall rocks. Relatively little attention was paid to the layered and more gently inclined rocks which form the bulk of the intrusion, and give rise to the recessive topography in part occupied by McGregor and Speers lakes. Much of this area of recessive topography is underlain by serpentinized dunite which, in the rare cases it outcrops, is friable weathered brown rubbly material.

The Muskox Intrusion intruded into rocks of widely different ages ranging from allochthonous Archean basement, through Aphebian rocks of the Coronation Supergroup (Akaitcho Group, Epworth Group and Recluse Group) and Hepburn Intrusive Suite to rocks of the Helikian Hornby Bay and probably the Dismal Lakes Groups. Hoffman (1980) suggested that the Muskox Intrusion is coeval with and even comagmatic with the Coppermine River basalts, basing his arguments on the nature of movements on two branches of the Canoe Lake Fault which displaces the Muskox Intrusion.

CURRENT WORK AND RESULTS

In 1986 both the northern (OX 8-14, 26) or Transition Lake and the southern (McGregor Lake) claim blocks were explored by 1:20 000 geological mapping, lithogeochemical surveys and soil sampling. Selected rocks were submitted to Vancouver Petrographics Ltd. for petrological examinations.

A total of 285 rock samples were collected. All of these were analysed for nickel, copper, platinum and palladium and 219 were also analysed for chromium.

Soil sampling was done concurrently with geological traversing. The 449 soil samples collected were analysed for copper, nickel, platinum, palladium and chromium.

Rock samples anomalous in platinum and palladium (Pt + Pd > 100 ppb) were obtained from several localities, mostly near the margins of the Muskox Intrusion as were anomalous soils (Pt + Pd > 50 ppb), but in only two cases in 22 sampling traverses were rock and soil anomalies coincident or closely spatially related.

International Platinum Corporation's program is directed to the exploration of three types of platinum group metals targets:

1. Hydrothermal deposits along faults cutting the Muskox Intrusion;
2. Deposits along the margins of the intrusion commonly associated with copper, nickel and iron sulphides and probably related genetically to steep temperature gradients at the margins of the intrusion and to contamination by and reducing effects of graphitic wall rock sediments of the Akaitcho and Epworth Groups;
3. Sulphidic layers enriched in platinum group metals within the 'core' of the Muskox Intrusion.

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CHAPTER 8
SLAVE STRUCTURAL PROVINCE

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Walter A. Gibbins, Arctic Islands District Geologist
Dorothy Atkinson, south Slave - Cordilleran District Geologist
Valerie Jackson, Project Geologist
Kate Hearn, Research Geologist

INTRODUCTION

This introductory section to the Slave Structural Province is essentially the same as that in the 1984-85 Mineral Industry Report, but the list of subdivisions under which properties are discussed has been modified.

About two-thirds of the Slave Structural Province is made up of sediments and volcanics of the Archean Yellowknife Supergroup that have been metamorphosed under greenschist to upper amphibolite grade conditions (Frith, 1978; Neilsen, 1978, Percival, 1979; Thompson, 1978). The supracrustal rocks, of which about 15% are volcanics, are exposed in sinuous and anastamosing belts locally wrapped around basement gneisses and commonly flanked, separated or interrupted by quartz diorite, quartz monzonite, granodiorite and granite intrusions. Relatively narrow volcanic belts containing various proportions of mafic, intermediate and felsic components are commonly flanked on one, rarely on both, sides by metasediments. The metasediments are predominantly greywacke, commonly interbedded with thinner pelitic layers with phyllitic or slaty cleavage. Topographically recessive phyllite may overlie and flank the volcanics or may be found locally within the volcanic sequence.

Contact relations of granitoid plutons with surrounding supracrustal rocks are generally concordant (Henderson, 1976), although crosscutting granodiorites, quartz monzonites and associated pegmatites have been mapped. Locally the plutons are bordered by migmatite. Contact metamorphic aureoles may be extensive or practically absent.

Economic mineral discoveries have been mainly in the volcanics, and consequently these rocks have been more intensely studied. Most of the volcanic belts have been covered, in many cases more than once, by airborne magnetic and EM surveys which have outlined numerous conductors mostly related to graphitic volcanogenic sediments or extensive zones of disseminated sulphides.

Since the early 1980's, spurred by a favourable economic climate for gold exploration and the opening of Lupin Mine, areas underlain by metasediments have been extensively explored for auriferous iron formation.

The extent of pre-Yellowknife Supergroup basement is still speculative and will remain so until more geochronological studies and detailed mapping have been done. Locally, plutonic gneisses and massive rocks of tonalitic composition unconformably underlie supracrustal rocks of the Yellowknife Supergroup, as at Point Lake (Baragar and McGlynn, 1976; Henderson, 1977; Henderson and Easton, 1977a,b). Commonly the basal contact of the Yellowknife Supergroup has been obliterated by granitic intrusions. Broad zones of granitic gneiss, migmatite and mixed gneisses, including or derived from Yellowknife Supergroup rocks (unit An of McGlynn, 1977), may include basement that is so far unrecognized. Some tonalitic clasts in the Yellowknife Supergroup sediments may be derived from unroofed syntectonic plutons.

Volcanic belts may comprise more than one cycle of volcanism, as do the Back River volcanic complex and the Courageous Lake-McKay Lake volcanic belt. Distally, the volcanics, in most cases, interfinger with the sediments that fill the greater part of the basins. Iron formations within the sediments may be distal products of volcanism. The sediments clearly show complex folding, whereas in the more competent volcanics the effect of such folding is obscure.

In this chapter, properties are grouped under headings indicative of common geological or, in a few cases, geographical settings. These headings and authors are:

1. Hiukitak River - Tinney Hills area, Walter A. Gibbins;
2. Hope Bay volcanic belt, Walter A. Gibbins;
3. High Lake supracrustal belt, J.B. Seaton;
4. Wilberforce Basin, J.B. Seaton;
5. Beechey Lake Basin, J.B. Seaton;
6. Regan Lake supracrustal belt, J.B. Seaton;
7. Contwoyto River metasedimentary belt, J.B. Seaton;
8. Point Lake - Itchen Lake - Contwoyto Lake metasedimentary belt, J.B. Seaton;
9. Indin Lake supracrustal belt, Dorothy Atkinson;
10. Russell Lake - Slemon Lake supracrustal belt, Valerie Jackson;
11. Yellowknife supracrustal belt, Dorothy Atkinson and Valerie Jackson;
12. Indian Mountain Lake, Dorothy Atkinson
13. Courageous Lake - MacKay Lake, Kate Hearn.

Supracrustal rocks of the Archean Yellowknife Supergroup include metavolcanic belts, metasedimentary belts, and mixed belts with important metavolcanic and metasedimentary components referred to as supracrustal belts. They are separated from one another by granitoid intrusions, basement gneisses and granitoids and/or Proterozoic sediments or Quarternary cover. It is not always possible to define the edge of a supracrustal belt precisely in the field, so for convenience projects that extend over adjacent granitic rocks along boundaries of a belt are included in the section on the appropriate volcanic belt.

BATHURST BLOCK - NORTHEASTERN SLAVE PROVINCE

In 1986-87, mineral exploration in the Bathurst Block (Padgham, 1981), the northeastern Slave Province, or Bathurst Terrane, was monitored by Walter A. Gibbins. The geology of the Bathurst Block was first outlined by Geological Survey of Canada helicopter supported reconnaissance mapping in the early 1960's (Fraser, 1964).

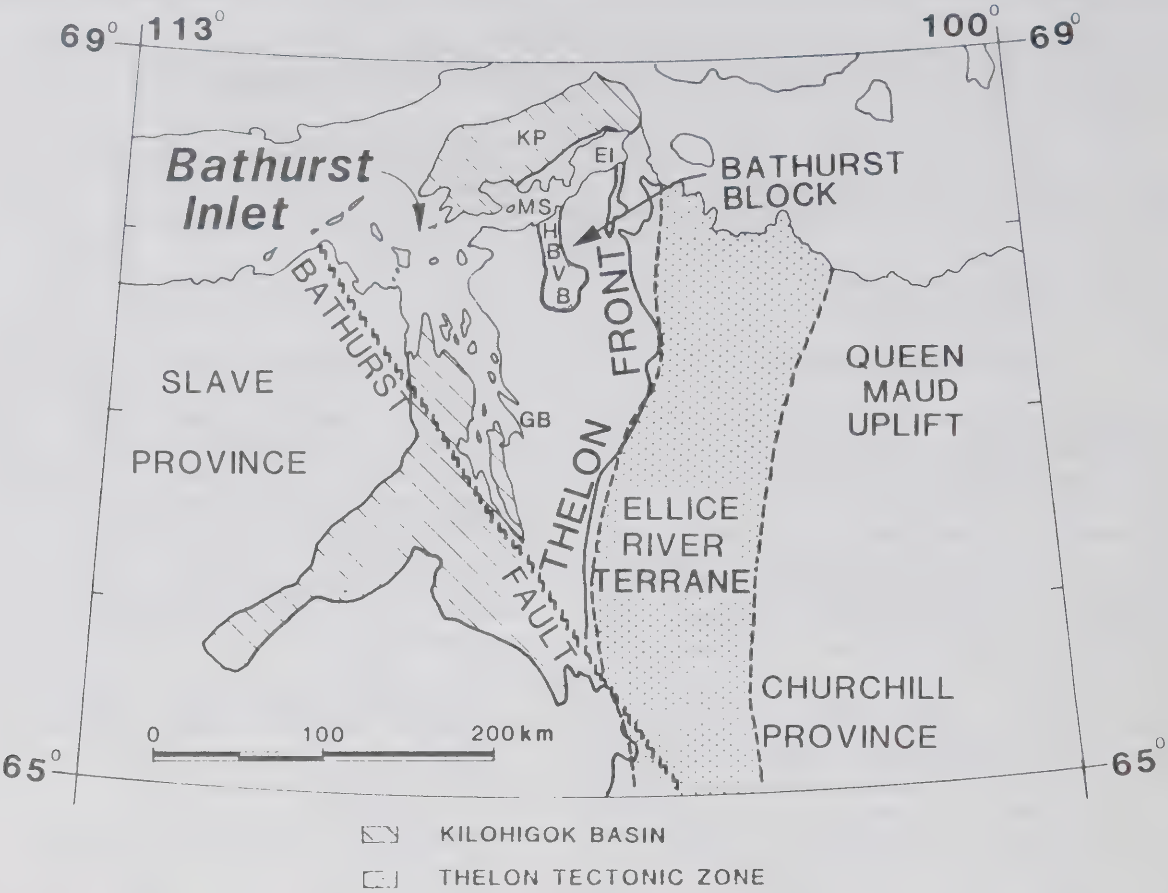


FIGURE 8-1: Regional geology of the northeastern Slave Province - Bathurst Block, modified from Thompson, 1986. Abbreviations: HBVB - Hope Bay volcanic belt; KP - Kent Peninsula; MS - Melville Sound; GB - Gordon Bay; EI - Elu Inlet.

Geographically, the Bathurst Block is bounded on the west by Bathurst Inlet, on the north by Melville Sound and Elu Inlet, and on the south and east by an imaginary line from the south end of Bathurst Inlet that swings northeast to Overby Lake, then north to the Arctic Coast. Geologically, it is bounded unconformably on the north and west by Goldburn Group sediments of the Proterozoic Kilohigok Basin (Campbell and Cecile, 1976, 1981), and on the south and east by the Ellice River Terrane along the Thelon Front (Fig. 8-1).

In 1986-87, mineral exploration was mainly for Lupin-type gold deposits in the Hiukitak River-Tinney Hills area (76 J) and gold or silver deposits in the Hope Bay volcanic belt (NE 76O, 77 A/3).

HIUKITAK RIVER - TINNEY HILLS AREA

Mineral exploration in the Tinney Hills - Hiukitak River area (76 J north half) was mainly for Lupin-type gold deposits in amphibolite iron formation horizons of Archean metasediments of the Yellowknife Supergroup. Canadian Nickel Ltd. staked a Lupin-type gold showing near Tinney Cove (76 J/11) in 1964 (Schiller, 1965; Thorpe 1972), however, very little mineral exploration was done in the area for the next 20 years. In 1984, increased gold prices, highly profitable operations at the recently developed Lupin Mine, the potential for additional Lupin-type deposits (Gibbins, 1981) and 1:250 000 scale mapping by the Geological Survey of Canada (Thompson and Aston, 1984; Thompson and Culshaw, 1985) all contributed to a sharp increase in exploration by a number of groups mainly in the Tinney Hills - Hiukitak River area. Echo Bay Mines Ltd., owner and operator of the Lupin Mine, became the most active company in the area and a large number of claims were staked in 1984 and 1985 (Seaton *et al.*, 1987, p. 195).

Much of the 1984-85 work was not submitted in time to be included in the 1984-85 Mineral Industry Report, so it is included here with the 1986-87 work. Some of the claims, such as NEST and JAN, were explored in some detail, but assessment work was not filed and the claims lapsed. Little or no work was done on other claims like the BEAK (76 J/7,10) and SHEL (76 J/16) claims. In 1986-87, both Echo Bay Mines Ltd. and Silver Hart Mines Ltd. conducted diamond drilling in the area.

REGIONAL GEOLOGY

Thompson and others (1985) divided the crystalline rocks of the Tinney Hills - Hiukitak River area into the Bathurst and Ellice River Terranes, west and east respectively of the "main boundary zone" (Fig. 8-1). In the south half of the area, this line coincides with a marked change in lithology, a relatively low-grade transcurrent shear zone, a characteristic aeromagnetic expression, and a swarm of metamorphosed and variably deformed diabase/gabbro dykes. This boundary was taken to be the western limit of the Thelon Tectonic Zone, that is the Thelon Front. The boundary is drawn along the contact between a "pink" gneissic to migmatitic granitoid unit and the main mass of metamorphosed supracrustal rocks of the Yellowknife Supergroup (Thompson *et al.*, 1986).

Most of the Bathurst Block is made up of aluminosilicate-bearing migmatites derived from pelitic schist and metagreywacke of the Yellowknife Supergroup. Thin zones or lenses of a highly variable lithologic package, including layered amphibolite, fine-grained quartzofeldspathic gneiss, pelitic schist/psammite, migmatite, marble/calcsilicate gneiss and metagabbro, are scattered across the metasedimentary terrane and associated with the migmatitic/plutonic complex to the north (Fig. 8-2).

Metamorphosed iron formation is composed mainly of garnet, quartz, grunerite, with variable amounts of plagioclase, hornblende, magnetite, pyrrhotite, pyrite and traces of chalcopyrite. Usually marked by a gossan, these rocks take the form of boudins or layers in the predominantly metasedimentary parts of the Yellowknife Supergroup. Commonly, thin layers of amphibolite and/or fine-grained quartzofeldspathic rocks are associated. The gossans mapped by Thompson (Fig. 8-2) are rusty metasediments, relatively rich in sulphides.

Across the map area it is possible to divide the metamorphic history into an early high-grade event and a later lower grade event. From the point of view of mineral exploration an important aspect of this map is the way in which the economically interesting Yellowknife Supergroup has been differentiated despite the widespread migmatization and complex deformation of these rocks. More specifically, it has been shown that gold-bearing meta-iron formation of the Lupin type is not restricted to the low-grade parts of the Yellowknife Supergroup. These rocks occur at all metamorphic grades and the gross stratigraphy with which they appear to be associated can be traced from Gordon Bay well into the migmatitic metasedimentary terrane (Thompson, 1986).

LB 1-9 CLAIMS

Chevron Minerals Ltd.	Gold
1900 - 1055 W. Hastings St.	76 J/9,10,15,16
Vancouver, B.C., V6E 2E9	66°44'37"N
	106°32'10"W

REFERENCES

Thompson (1986); Thompson *et al.* (1985, 1986).
DIAND assessment report: 082522.

PROPERTY

LB 1-9.

LOCATION

The LB claims are southeast of Bathurst Inlet, 6 to 18 km south of the Hiukitak River and 22 to 28 km east of the southeastern most Gordon Bay (13 in Fig. 8-2). The claims are centred near 66°45'N and 106°30'W, 600 km northeast of Yellowknife.

HISTORY

Gold showings were discovered by prospectors William W. Kizan and Lloyd E. Anderson in 1985. They recorded the LB 1 and 2 claims in September 1985 and LB 3 and 4 in July 1986. Chevron Minerals Ltd. confirmed anomalous gold assays in 1985 and optioned the claims. Later they formed a joint venture with Galveston Resources Ltd. The LB 5-9 claims were added in April 1987. There is no evidence of prior work on these showings.

DESCRIPTION

The geology of the area is described by Thompson and others (1985, 1986) and was mapped at 1:125 000 scale by Thompson (1986). The claims are underlain by Archean rocks, mainly Yellowknife Supergroup metasediments and granitic rocks of the Bathurst Terrane (Fig. 8-2). The sediments are turbidite greywackes and pelites that have undergone middle to upper amphibolite facies metamorphism to form cordierite knotted schists and sillimanite schist, gneiss or migmatite.

Detailed mapping at 1:10 000 scale by Chevron Minerals Ltd. was based on several sub-units of the Yellowknife Supergroup. Particular attention was given to tracing iron formation, considered to be a potential ore unit. Silicate (amphibolite ± garnet), sulphide (pyrite) and oxide (magnetite) facies are present. Similar host rocks at Lupin Mine, Homestake Mine, South Dakota and Jardine Mine, Montana contain large high-grade gold deposits.

Two or more periods of tectonism is shown by folded, stretched and boudinaged rocks. Three major north-northeast-trending faults displace iron formation and possibly isograds and late gabbro dykes.

CURRENT WORK AND RESULTS

The 1987 work required seven people for three months and was designed to validate and delineate known showings, prospect for additional showings, to better understand the geology and gold distribution, and to identify and evaluate drill targets. Fourteen showings were examined by 85 km of grid, 278 m of trenching, detailed mapping (1:500 or 1:100 scale), lithogeochemistry, and petrography. The entire claim block was mapped at 1:10 000 scale and flown with a DIGHEM III survey.

Trace element data from 268 samples of iron formation were analyzed using a statistics package for single and multi-element comparisons. Data from known productive and barren iron formations elsewhere in the Slave Province were compared. Gold was found to correlate with arsenic, sulphur and copper. These elements are present in amounts comparable to other economic iron formations, but bismuth, lead, antimony and silver are lower. Factor analysis ranked the showings using the Slave function and principle components function. According to these rankings, showings at the north and south ends of the claim block have the best gold potential.

Some specimens are clearly clastic sediments, but the lack of micas and feldspars indicate the rest are typical of Slave Province iron formation. The absence of any sign of hydrothermal or carbonate alteration, the lack of base-metal sulphide minerals, and the association of visible gold within silicates or arsenopyrite-loellingite (but not pyrite) are all considered typical of Slave Province iron formation deposits. Pyrrhotite is rare and laminated sulphides of Lupin-type deposits are absent. Correlation of geology and geophysical mapping shows that the iron formation can be over or adjacent to magnetic anomalies, near weak EM or VLF EM conductors, and associated with a broad resistivity anomaly. Gabbro dykes are thought to account for most of the magnetic anomalies because magnetite is uncommon and pyrrhotite very rare in the iron formation.

The best chip sample assays are from Showing #1: 90.5 g/t Au over 48 cm and 29.8 g/t Au over 57 cm, showing #5: 24.7 g/t Au over 75 cm, 11.4 g/t Au over 75 cm, 8.5 g/t Au over 79 cm, and 6.38 g/t Au over 25 m. Other samples from the showings contain gold in the range of 1 to 6 g/t.

Drilling, ground geophysics and additional trenching are recommended.

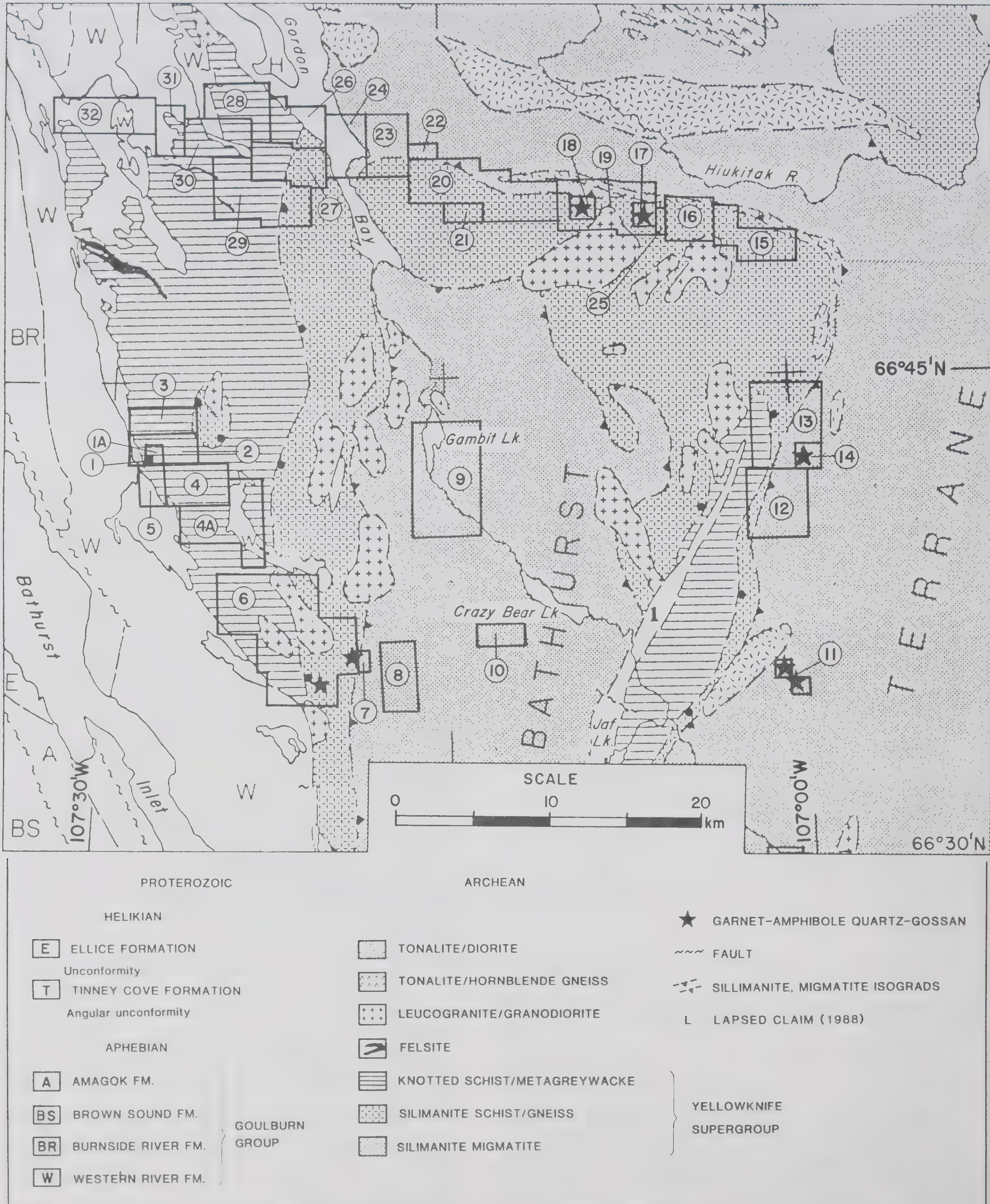


FIGURE 8-2: Geology of the Tinney Hills - Hiukitak River Area (76 J) from Thompson, 1986. Claims in good standing December 1987. Claims marked L had lapsed December 1988.

KEY TO PROPERTIES - FIG. 8-2

No.	NTS	Regist'd	Claims	Owner
1	76J/11	82-10-18	G&T2	BCHE
1A	76J/11	83-09-19	G&T 1,3,6	BCHE
2	76J/11	84-03-26	FOX 1,2	SHML
3	76J/11	85-09-09	FOX 5,6	SHML
4	76J/11	84-03-26	FOX 3	SHML
4A	76J/11	84-03-26	CHAR 1,2	SHML
5	76J/11	85-09-09	FOX 4	SHML
6	76J/11	84-10-09	HEN 1-6	EBML
7	76J/11	85-03-18	BC 6	BCHE
L8	76J/11	85-08-22	NEST	EBML
L9	76J/10,11	85-08-12	JAN 1-3	EBML
10	76J/10	84-08-28	CLEAR	EBML
11	76J/9,10	85-03-18	BC 4,5	BCHE
12	76J/9,10	85-08-27	WING	EBML
13	76J/9,10	85-09-13	LB 1-9	CGJV
14	76J/9	85-10-28	BC 3	BCHE
L15	76J/15,16	85-10-17	EGG 2,3	EBML
L16	76J/15	85-07-25	EGG	EBML
17	76J/15	85-03-18	BC 2	BCHE
18	76J/15	85-03-18	BC 1	BCHE
19	76J/15	85-09-3,6	BEAR1,4-6	EBML
20	76J/14,15	85-08-22	BEAR 2,3	EBML
21	76J/15	85-09-06	BEAR 7	EBML
L22	76J/14	85-10-17	BEAR 10	EBML
23	76J/14	85-09-27	BEAR 9	EBML
24	76J/14	85-09-27	HUNT 8	EBML
25	76J/14	85-10-17	BEAR 8	EBML
26	76J/14	85-10-17	HUNT 7,13	EBML
27	76J/14	84-10-09	HUNT 1,2	EBML
28	76J/14	85-09-27	HUNT 9,10	EBML
29	76J/14	85-28-22	HUNT 4,5	EBML
30	76J/14	85-07-29	HUNT 3	EBML
31	76J/14	85-10-17	HUNT 6	EBML
32	76J/13,14	85-09-17	HUNT11,12	EBML
33	76J/16	87-05-15	BL 1-4	LAWK
34	76J/15	87-08-04	BL 5,6	LAWK
L35	76J/16	85-08-22	SHEL	EBML
36	76J/13	86-10-02	BC - 9	BCHE
37	76J/15	86-07-29	ENEX	ENEX
L38	76J/	85-08-22	BEAK	EBML

Abbreviations:
BCHE - Bear Creek Hills Estate Ltd.
EBML - Echo Bay Mines Ltd.
SHML - Silver Hart Mines Ltd.
CGJV - Chevron Galveston Joint Venture
ENEX - Enexco International Ltd.
LAWK - Lloyd Anderson/William Kizan
* L Lapsed - December 88.

WING CLAIM

Echo Bay Mines Ltd.
354 Granville Sq.
200 Granville St.
Vancouver, B.C., V6C 1S4

Gold
76 J/9,10
66°41'N, 106°30'W

REFERENCES

Thompson (1986); Thompson and Culshaw (1985); Thompson *et al.* (1985, 1986).

DIAND assessment reports: 082573, 082574.

PROPERTY

WING.

LOCATION

The WING claim is in the Hiukitak River area, east of Bathurst Inlet and about 625 km northeast of Yellowknife. It is 28 km southeast of the head of Gordon Bay and 25 km southwest of the big bend in the Hiukitak River (12 in Fig. 8-2) and adjoins the LB claims to the north and the BC 3 claim to the northeast.

HISTORY

Thompson and Culshaw (1985) mapped several quartz-amphibole-garnet gossans in the area, including one on the adjacent BC 3 claim. The BC 3, LB 1 and 2, and WING claims were staked in March, August and September 1985 respectively.

DESCRIPTION

Thompson and others (1985, 1986) describe the area as sillimanite migmatite of the Yellowknife Supergroup. Narrow discontinuous lenses of iron formation were found in the north half of the claim. Foliation in the iron formation trends north-northeast and dips steeply to the east. Sulphide-poor iron formation predominates, but small zones of sulphide-rich (pyrite/arsenopyrite) and magnetite zones are also present. Rusty metasediments contain up to 10% pyrite, but no gold.

The central part of the eastern claim boundary is cut by a northeast-trending diabase dyke and a small stock (less than 2 km diameter) of massive medium-grained granodiorite.

CURRENT WORK AND RESULTS

In 1985 aerial reconnaissance was followed with a ground traverse that revealed anomalous gold content in iron formation (2.91 and 3.61 g/t Au at showing B-40, Fig. 8-3). However, B-40 had been located incorrectly and the showing is within the LB1 claim. The WING claim was staked to protect the southerly extension of iron formation at B-40 and a magnetometer survey tested 800 m by 500 m of this area. The strongest anomaly corresponds to diabase boulders, but a second weaker anomaly is along strike with the iron formation at B-40.

In 1986, a geochemical program identified a few gold-bearing iron formation boulders south of B-40. One sample from the south end of a small lake on the B-40 trend assayed 11.52 g/t Au. A few samples from the northern east boundary gave low gold assays, ranging from 1 to 2.5 g/t Au.

In May 1987, a 250 by 500 m grid was established on Kizan Lake, a small lake that extends south from near the mid-point of the northern boundary of the WING claim. A magnetometer survey suggests that iron formation at B-40 on the LB claims may extend under Kizan Lake.

Exploration in the southern portion and south of the claim was unsuccessful in finding iron formation or anomalous gold assays.

JAN CLAIMS

Echo Bay Mines Ltd.
354 Granville Sq.
200 Granville St.
Vancouver, B.C., V6C 1S4

Gold
76 J/10,11
66°41'N, 107°W

REFERENCES

Thompson (1986).

PROPERTY

JAN 1-3.

LOCATION

The claims are centred on the southern half of Gambit Lake, about 30 km east of Tinney Cove on Bathurst Inlet (9 in Fig. 8-2). The area is about 500 km northeast of Yellowknife.

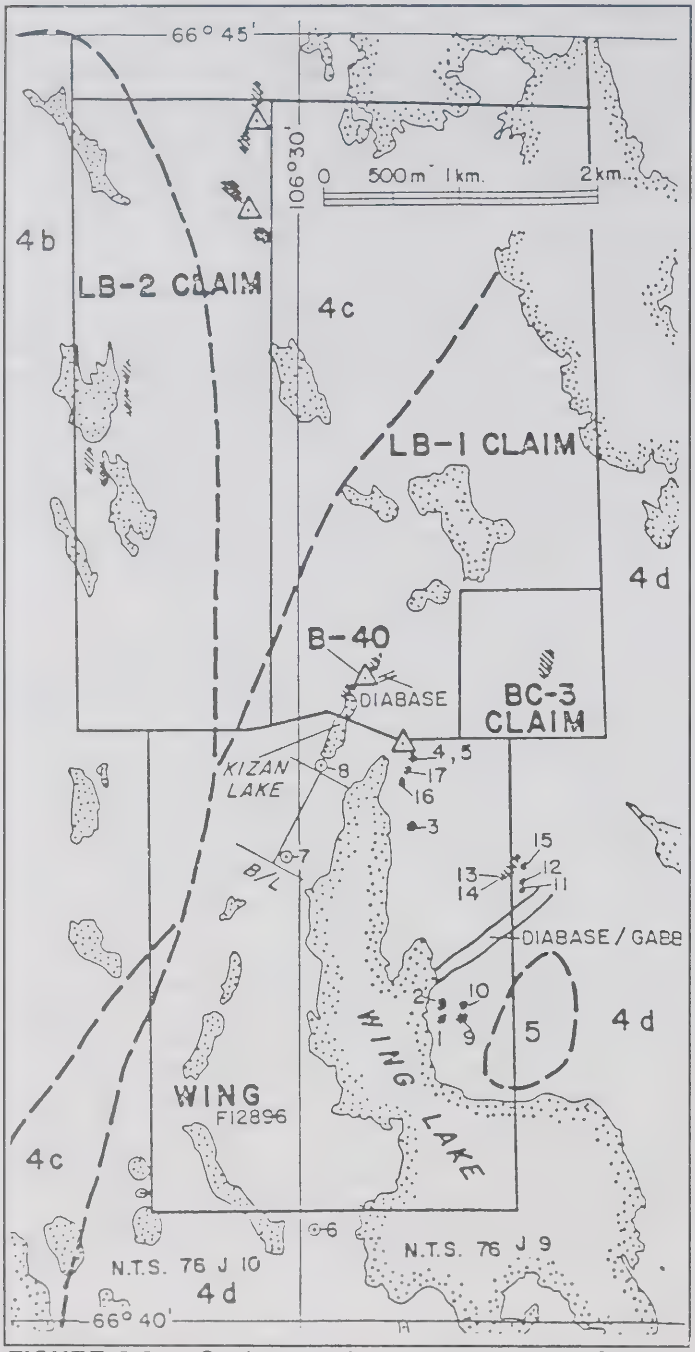


FIGURE 8-3: Geology and sample sites WING claim, from DIAND assessment report 082573.

ASSAY SAMPLE NUMBERS AND GRADES

1	(.07)	7	(.21)	13	(1.03)
2	(.34)	8	(11.52)	14	(.17)
3	(.07)	9	(.21)	15	(.27)
4	(1.94)	10	(.48)	16	(.24)
5	(1.54)	11	(2.50)	17	(.24)
6	(.03)	12	(1.37)		

LEGEND (AFTER THOMPSON 1986)

4b - KNOTTED SCHIST AND METAGREYWACKE
4c - SILLIMANITE SCHIST / GNEISS
4d - SILLIMANITE MIGMATITE
5 - TONALITE / GRANODIORITE
6 - TWO MICA GRANITE - GRANODIORITE
10 - WESTERN RIVER FORMATION (Proterozoic)
- DIABASE DYKE
- GOLD SHOWING 34 g/t
- IRON FORMATION
- 22329 (11.52) SAMPLE NUMBER (Au g/t)

HISTORY

The JAN claims were recorded in August 1985, following a regional reconnaissance sampling program. They lapsed in 1987.

DESCRIPTION

The claims encompass sillimanite migmatite gneisses of the Yellowknife Supergroup (Fig. 8-2; Thompson, 1986).

CURRENT WORK AND RESULTS

In 1986, a grid was established over the George showing on JAN 1. This showing contains large (up to 5 cm diameter) books of biotite and abundant red garnets (J.B. Seaton, pers. com. 1986). A chip sample assayed 10-12 g/t Au across 3 m. The showing is confined to a 1500 m² pod of iron formation.

NEST CLAIMS

Echo Bay Mines Ltd.	Gold
354 Granville Sq.	76 J/11
200 Granville St.	66°35'N, 107°04'W
Vancouver, B.C., V6C 1S4	

REFERENCES

Ames (1986); Thompson (1986).

PROPERTY

NEST Claim.

LOCATION

The NEST claim is near Bear Creek Hills, 15 km east of southern Bathurst Inlet (8 in Fig. 8-2).

HISTORY

The NEST claim was recorded in August 1985, as a result of a regional reconnaissance sampling program. The property was mapped and sampled in 1985 (Ames, 1986).

The claim lapsed in late 1987.

DESCRIPTION

The NEST claim is underlain by an auriferous iron formation within migmatite gneisses of the Archean Yellowknife Supergroup (8 in Fig. 8-1). Iron formation forms boudinaged pods within sillimanite gneiss and is predominantly silicate facies with disseminations of magnetite and iron sulphide (Ames, 1986). Two phases of regional metamorphism were recognized.

According to Ames (1986), the iron formation consists of 1-2 cm quartzite bands alternating with similar iron silicate bands composed primarily of grunerite and hornblende with minor garnet, pyroxenes and quartz. Disseminated and massive pyrite, arsenopyrite and magnetite are present locally in the iron silicate bands. Gold is generally enriched in the iron formation. Very anomalous gold concentrations in the nose of a minor antiformal structure in the iron formation suggest remobilization of syngenetic gold into structural sites during the high grade metamorphic event.

CURRENT WORK AND RESULTS

1985: The only information available for the 1985 field season comes from Ames (1986). A grid was set up and detailed mapping, sampling, a magnetic survey, and possibly a VLF EM survey, were done.

Echo Bay Ltd.'s analysis of chip sampling across iron formation bands indicated anomalous gold concentrations throughout the iron formation. Even sulphide-poor samples yield over 5 g/t Au. However, sulphide-rich samples are more anomalous with a maximum gold content of 91.37 g/t. Within the sulphide-rich bands gold concentrations are irregular and vary dramatically over very short distances both along and across strike. For example: XR19164 (1.75 g/t Au) and XR9426 (86.09 g/t Au) were taken 1 m apart across strike; and XR20273 (12.75 g/t) and XR19152 (0.21 g/t) were collected 1 m apart along strike.

Gold content has a strong positive correlation with sulphur content, but is not specifically associated with any one mineral such as pyrite or arsenopyrite.

Gold is structurally controlled in the NEST iron formation, with the highest grades in the nose of a minor antiformal structure.

Microprobe analysis of pyroxenes and amphiboles demonstrate these to be very iron-rich species. Magnetite-rich samples show only slight iron enrichment in actinolite-hornblende and grunerites. Calcium is enriched in hornblende. Analysis of pyroxenes revealed a number of species including ferrohypersthene, subcalcic ferroaugite and hedenbergite.

1987: Three holes, totalling 210 m, were drilled on the NEST zone (65°35'N, 107°04'W). Evidently, the results were not encouraging, as no assessment work was submitted and the claims were allowed to lapse.

HEN CLAIMS

Echo Bay Mines Ltd.	Gold
354 Granville Sq.	76 J/11
200 Granville St.	66°34-39'N
Vancouver, B.C., V6C 1S4	107°08-22'W

REFERENCES

Fraser (1964); Thompson (1986); Thompson *et al.* (1985, 1986).

DIAND assessment report: 082598.

PROPERTY

HEN 1-6 (6270 ha).

LOCATION

The claims are near the southern end of Bathurst Inlet (6 in Fig. 8-2). The area is 575 km northeast of Yellowknife and 215 km east-northeast of Lupin Mine at Contwoyto Lake.

HISTORY

The claims were staked in 1984, following helicopter-reconnaissance exploration. During the 1960's Roberts Mining Ltd. explored the area north of the HEN claims (now the G&T claims), but apparently did not explore the area of the HEN claims.

DESCRIPTION

The area is underlain by highly metamorphosed sediments of the Archean Yellowknife Supergroup separated by large zones of granodiorite and granitic gneisses. The area has been mapped by Fraser (1964) and by Thompson and others (1985, 1986). Proterozoic sedimentary rocks of the Kilohigok Basin overlie Archean rocks along the southwestern edge of the claim block (Figs. 8-2 and 8-4).

The principal exploration target is gold in sulphidic silicate iron formation, similar to that found in the Lupin and Homestake mines. In the claim area iron formation commonly trends north-northwesterly and outcrops are fairly abundant (Fig. 8-4). Additional iron formation is believed to underlie the numerous lakes. The iron formation is mainly sulphide-poor silicate facies iron formation, however, oxide and sulphide facies are present as well.

CURRENT WORK AND RESULTS

1984: Eight gold showings were identified on the HEN claims (Fig. 8-4). All of these are related to iron formation.

B-1 Showing (HEN 1)

Grab samples XR8837, 8838 assayed 2.43 and 3.43 g/t Au and soil sample 84 RM149 from the same area returned 4160 ppb Au. Resampling yielded a maximum value of 0.93 g/t Au over 1 m. One soil and 21 rocks samples were collected.

The highest assay for samples collected over a 2 km strike length to the north was 1.20 g/t Au.

The zone ranges up to 15 m in width and consists of amphibolite and garnet amphibole layers. Pyrite content ranges from traces to 10%. Thin magnetite seams were observed in amphibolite. Arsenopyrite is present in trace amounts.

The zone strikes north and dips at 50-70 degrees east. Continuous iron formation ends 200 m south of the B-1 showing, but there are isolated pods and lenses along strike that may continue south to southeast to the B 5-7 showings.

B-2 Showing (HEN 1)

Six lenses of iron formation were sampled in a 300 m by 50 m area at the southern end of Pippin Lake; 25 rock samples were taken. The best assay, 3.98 g/t Au, was from a grab sample within a zone 200 m long and up to 5 m wide. Four other samples from this zone assayed between 1 and 2 g/t Au. The other zones are lensoid in nature and contain localized gold up to 3.84 g/t Au.

Locally, amphibolite and garnet amphibole rocks contain up to 20% sulphides and arsenopyrite. Minor quartz veins are present.

B-3 Showing (HEN 1)

Sample XR 15803 assayed 2.88 g/t Au. The remaining eight were less than 0.48 g/t Au. Two small subparallel lenses or iron formation up to 1 m in width, contain small pods (up to 20 by 30 cm) of sulphides, mainly pyrrhotite, pyrite, and minor arsenopyrite.

Quartz veins up to 1 m in width were also sampled.

B-4 Showing (HEN 1)

Grab Samples XR 15871 and 13810 assayed 22.35 and 17.49 g/t Au, and chip samples XR 13763 and XR 13764 assayed 10.18 and 6.00 g/t Au over 1.5 m and 1.2 m respectively. A 25 m wide lens of iron formation is exposed for 250 m. To the south it pinches out while to the north it is

covered by a lake. It comprises well banded amphibolite and garnet amphibole rocks with local sulphide-rich bands and pods and contains up to 30% pyrite, arsenopyrite and pyrrhotite.

Several smaller lenses of iron formation were sampled in the immediate area and sample XR 15807 gave 4.25 g/t Au from massive pyrite with 5% arsenopyrite. A total of 22 samples were taken.

B-5 Showing (HEN 1)

The following is a list of the highest assays from 21 samples taken in the area:

Gold Assays (g/t)

Sample Number	Original	Resample	Chip Sample
XD 15879	187.72	2.81	0.27/1.1 m
XD 15878	53.57	27.63 and 15.72	1.11/1.8 m
XD 13760 (20 m S 879)	-	-	3.74/1.3 m
XD 13518 (80 m N 879)	5.35	-	3.87/1.0 m

Lenses of iron formation are poorly exposed between two large north-northwest-trending diabases on the northwest shore of Arseno Lake. The iron formations dip at 50° to the east and can be traced intermittently to the northwest for over 1 km.

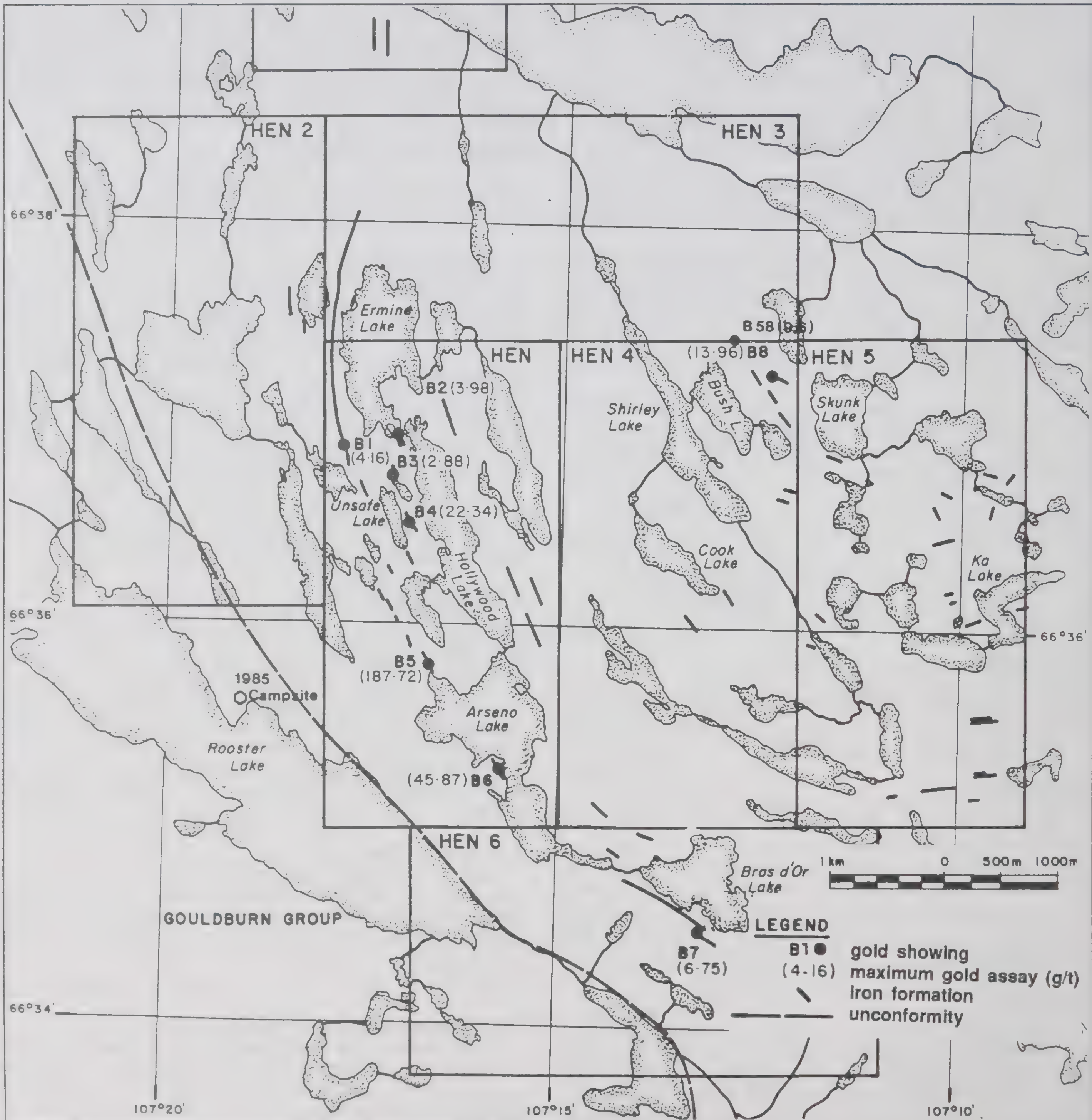


FIGURE 8-4: Gold showings HEN claims, from DIAND assessment report 082598.

B-6 Showing (HEN 1)

Grab Sample XR 15890 assaying 45.87 g/t Au was taken from a lens of iron formation located on a point on the southwest side of Arseno Lake. Three other grabs gave 8.30, 2.67 and 2.37 g/t Au. These high assays came from a pod of banded pyrite (2-5%) and arsenopyrite (10%). Minor magnetite is present. There is more than one lens of iron formation, but field reports give no details of size. The showing is southeast along strike from B-5.

Ten samples were taken.

B-7 Showing (HEN 6)

Six grab samples (XR 13503-08) assaying between 2.09 and 6.75 g/t Au were taken from a lens of iron formation 2.5 km southeast along strike from the B-6 showing. Up to 35% pyrite and arsenopyrite with some banding are in amphibolite-rich iron formation to 4 m in width. There are both oxide and silicate facies.

Additional samples, taken along strike to the the north-northwest for 800 m, returned only one anomalous gold assay (2.09 g/t Au).

B-8 Showing (HEN 4)

Grab samples XR 15828, 15834 assayed 13.94 and 2.02 g/t Au from amphibolite and garnet amphibole rocks containing only minor sulphides. Numerous bands of iron formation, mainly oxide facies, up to 10 km wide are in the area, but are not auriferous. Similar oxide iron formations to the southeast in HEN 5 returned low gold assays. The area is structurally complex.

The Geological Survey of Canada (Thompson, 1986) mapped additional iron formation to the east of B-7, within the HEN 6 claim.

1985: A grid was established in the area with the greatest concentration of showings, mainly the HEN 1 claim. The base line extends from the south end of Arseno Lake to the north end of Ermine Lake (Fig. 8-4), with cross lines every 80 m. The entire grid was tested with a VLF EM survey (77 km) and areas underlain by lakes were tested by a magnetometer survey (35 km). Much of the grid was mapped at 1:2500 scale and 691 grab or chip samples were collected for assay.

The VLF and magnetometer survey show a strong anomaly extending more than 350 m south from the B-5 showing under the northern part of Arseno Lake (Fig. 8-4). VLF also gave a good response in the northwest part of the grid (west of Ermine Lake), but chip sampling returned only low gold assays.

Overall assay results from the 1984 showings were poor and failed to show economic potential for gold. The best showing (B-4, east of Unsafe Lake) covers a ridge of gold-bearing sulphide-rich iron formation with fairly consistent gold content, averaging 3.8 g/t Au and 0.3 m wide, over a 40 m strike length. Additional iron formation was identified and sampled in areas north and south of Ermine Lake, and northeast of Bras d'Or Lake.

A ninth gold showing B-58, near the HEN 3 - HEN 4 boundary, is a north-trending iron formation, 3-5 m wide and 100 m long. A composite grab sample assayed 9.6 g/t Au.

G&T, FOX and CHAR Claims

Silver Hart Mines Ltd.	Gold
5710 17th St.	76 J/11
Edmonton, Alta., T6P 1S4	66°42'18"N
	107°26'30"W

REFERENCES

Roscoe *et al.* (1988); Schiller (1965); Thompson (1986); Thompson *et al.* (1986); Thorpe (1972).

DIAND assessment reports: 062214, 081819 (1984 work), 082653 (1987 work).

PROPERTY

G&T 1-6, FOX 1-6, CHAR 1-2.

LOCATION

The claims are near the Tinney Hills about 620 km northeasterly from Yellowknife. They extend south and east from the south end of Kathleen lake, which is about 8 km east of Bathurst Inlet (1-5 in Fig. 8-2).

HISTORY

The Main zone on the G&T claims was originally staked by Canadian Nickel Company in 1964 as the OX 1-10 group and were explored by trenching and by one packsack drill hole. During the same season Noel Avadluk prospected the area now contained within the CHAR 1 and CHAR 2 claims on behalf of Roberts Mining Co. (Schiller, 1965).

In 1967, Moresby Mines Ltd. and Trans-Canada Oils Ltd. restaked the lapsed OX group as the COT group. A total of 13 trenches were excavated and sampled. The assays ranged from a trace to maximum of 12.0 g/t Au across 0.27 m in Pit 5, 29.5 g/t Au across 0.61 m and 10.5 g/t Au across 3.35 m in Pit 4 (Thorpe, 1972, p. 110).

In 1982 and 1983, G. Warner restaked the area as the G&T 1-6 in the name of Bear Creek Hills Estate. In 1984, Silver Hart Mines Ltd. entered into an option agreement for the G&T claims and staked the adjoining FOX 1-3 and CHAR 1-2 claims. The FOX 4-6 were added in 1986.

In 1984, 457 m (7 holes) tested a 300 m section of iron formation in the "Main Zone", on G&T 2. Some of this work was submitted in DIAND assessment report 081819 and a summary of assays from these drill holes is given in Table 1 of DIAND assessment report 062214. The claims were mapped and prospected in 1984 and 1985.

Late in 1985, Silver Hart Mines Ltd. optioned the claims to Vanstate Resources Ltd. of Vancouver, but remained project operators.

DESCRIPTION

The area is underlain by Archean nodular schists and metasediments of the Yellowknife Supergroup (Thompson, 1986). These rocks are complexly folded and altered by low to high greenschist and retrograde metamorphism. West of the claims, these rocks are covered by Proterozoic sediments of the Goldburn Group (Fig. 8-2).

Amphibolitic silicate-, sulphide- and oxide-facies iron formations are similar to that found in the Lupin area, northern Contwoyto Lake, and the Pistol Lake area, on the west side of Bathurst Inlet (Roscoe *et al.*, 1988). One northwest-trending northwest-dipping band of iron formation has been traced in a southerly direction to the HEN claims, a distance of 30 km. It varies from 3 to 100 m in width and contains most of the important gold showings (Fig. 8-5). However, most of the iron formation in the area is less than 3 m thick and discontinuous.

Gold is found mainly in lenses of sulphide-facies iron formation. The highest and most consistent gold concentration is associated with a combination of wispy to banded pyrite and arsenopyrite, but the gold is erratically distributed. Sulphide-facies iron formation contains at least 5% sulphide minerals (pyrrhotite, pyrite and arsenopyrite); the remainder is mainly chlorite and hornblende, but also grunerite, quartz, garnet,

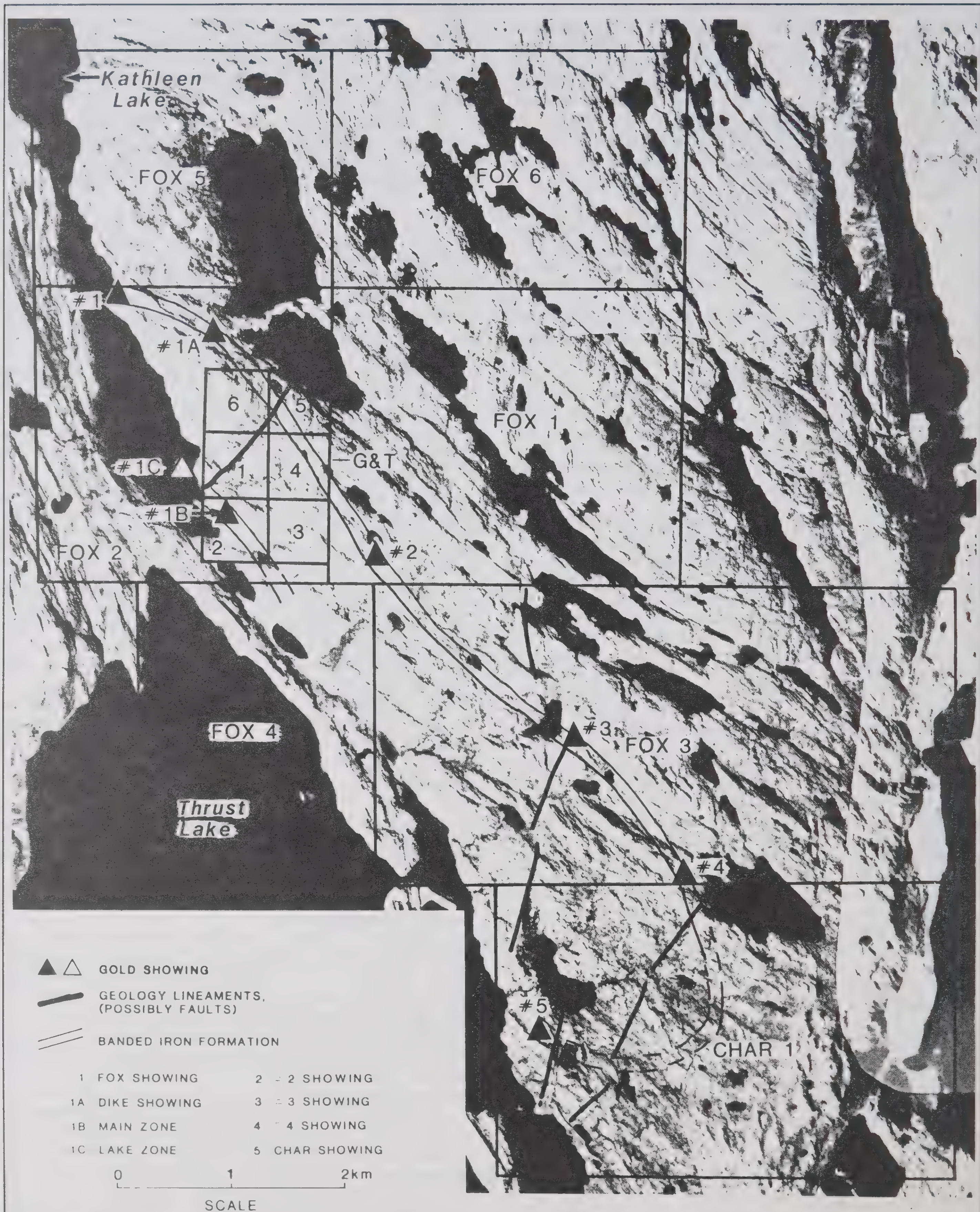


***FIGURE 8-5:** Gold showings FOX and G&T claims, Kathleen lake, from DIAND assessment report 062214.*

hedenbergite and at times magnetite. High sulphide zones are related to quartz veining and folding.

Drilling has been mainly in the Main zone, and its northwesterly extension, the Lake Zone (Fig. 8-5). This area, at the southeast end of Kathleen lake (Fig. 8-5), includes the original discovery. Hole 84-7 intersected 0.76 m of 11.0 g/t Au and 0.76 m of 4.5 g/t Au between 51.08 to 51.82 and 52.58 to 53.34 m (DIAND assessment report 062214). The results from holes 84-1 and 84-2 are shown in Figure 8-6.

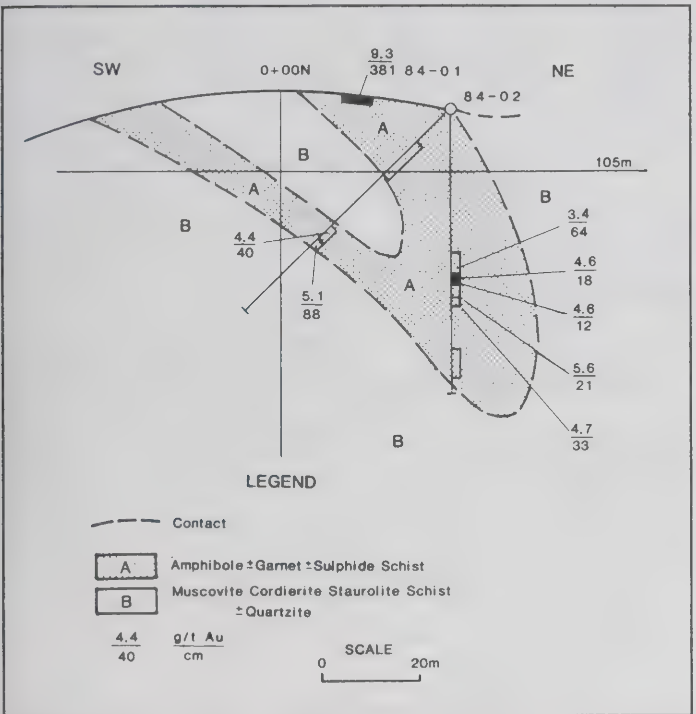


FIGURE 8-6: Cross section of main zone, G&T claims, Kathleen lake, from DIAND assessment report 062214.

CURRENT WORK AND RESULTS

1986: In 1986, Silver Hart Mines Ltd. did reconnaissance and detailed geological mapping, magnetometer and VLF surveying trenching and sampling. The area was flown with a DIGHEM system as part of a regional survey of all Silver Hart Ltd. claims in the Bathurst Inlet area.

In August and September, seven holes (365 m) tested the northwesterly extension of the Main zone. The best intersection, 11.97 g/t Au over 1.55 m, was in hole 86WP07 near the shore of Kathleen lake.

1987: In April, the magnetometer survey was extended northward on the ice of Kathleen lake. Iron formation was traced under Kathleen lake and the Proterozoic cover rocks.

Magnetic lows, possible sulphide-facies iron formation, along this trend were drill tested in May by 19 holes (1811 m) drilled from the ice of Kathleen lake. The first two holes, designed to extend the zone intersected in hole 86WP07, failed to intersect any significant zones of sulphide facies iron formation. However, several drill holes 300 to 500 m northwest of 86WO07 defined a zone of mineralized sulphide-facies iron formation. This zone has a strike length of 200 m, a down-dip extension of 100 m and widths up to 4.62 m. However, grades in this zone were low with a high assay of 3.98 g/t Au over 1.48 m.

The CHAR 1,2 and FOX 3 claims have lapsed.

HUNT CLAIMS

Echo Bay Mines Ltd.	Gold
354 Granville Sq.	76 J/13,14
200 Granville St.	66°51'-54'N
Vancouver, B.C., V6C 1S4	107°5'-35'W

REFERENCES

Fraser (1964); Thompson (1986); Thompson and Culshaw (1985); Thompson *et al.* (1985, 1986).

DIAND assessment report: 082589.

PROPERTY

HUNT 1-13 (10 300 ha).

LOCATION

The 13 HUNT claims are between latitude 66°51'N and 66°54'N and extend easterly from the Tinney Hills to the east side of central Gordon Bay (24-32 in Fig. 8-2). The area is 6 to 28 km east of Bathurst Inlet, 220 km northeast of the Lupin mine and 610 km northeast of Yellowknife.

HISTORY

The HUNT 1 and 2 claims were staked the fall of 1984, after obtaining favourable assays from reconnaissance sampling. Field work in 1985 prompted the staking of an additional 11 claims and several holes were drilled in the Lynn zone (HUNT 2) and Penny zone (HUNT 3) in the fall of 1985.

DESCRIPTION

The area was mapped at a regional scale by Fraser in 1964 at 1" to 8 miles. Thompson and Culshaw (1985) and Thompson (1986) mapped NTS areas 76 J and 76 I west 1/2 at 1:250 000 scale. Thompson and others (1985, 1986) noted several areas of quartz-amphibolite gossan that led to exploration in the area from 1984 to the present.

Outliers of Proterozoic Goldburn Group, Western River Formation quartzites, of the Kilohigok Basin are exposed in the westernmost claims (HUNT 11 and 12 - 32 in Fig. 8-2). The rest of the claims are underlain by a thick succession of highly-metamorphosed, Archean clastic sediments of the Yellowknife Supergroup.

Lenses and bands of iron formation within the clastic sequence host all of the gold showings. The iron formation is laterally extensive and thicknesses approach 60 m at some places. Tight, isoclinal folds are often developed. At least four separate gold bearing iron formations are recognizable. Gold is almost always associated with sulphide-rich iron formation. Detailed chip sampling and diamond drilling indicate that the sulphide-rich zones are closely associated with quartz veining and are extremely discontinuous along strike and down dip.

CURRENT WORK AND RESULTS

1984: Helicopter-supported rock sampling in 1984 revealed three areas of anomalous gold. They are identified as B9 (Lode Lake zone), and B10 and B11 (Lynn zone)(Fig. 8-7).

At B-9, silicate-, oxide-, and sulphide-facies iron formation are exposed over the apparent east-northeast strike of this showing.

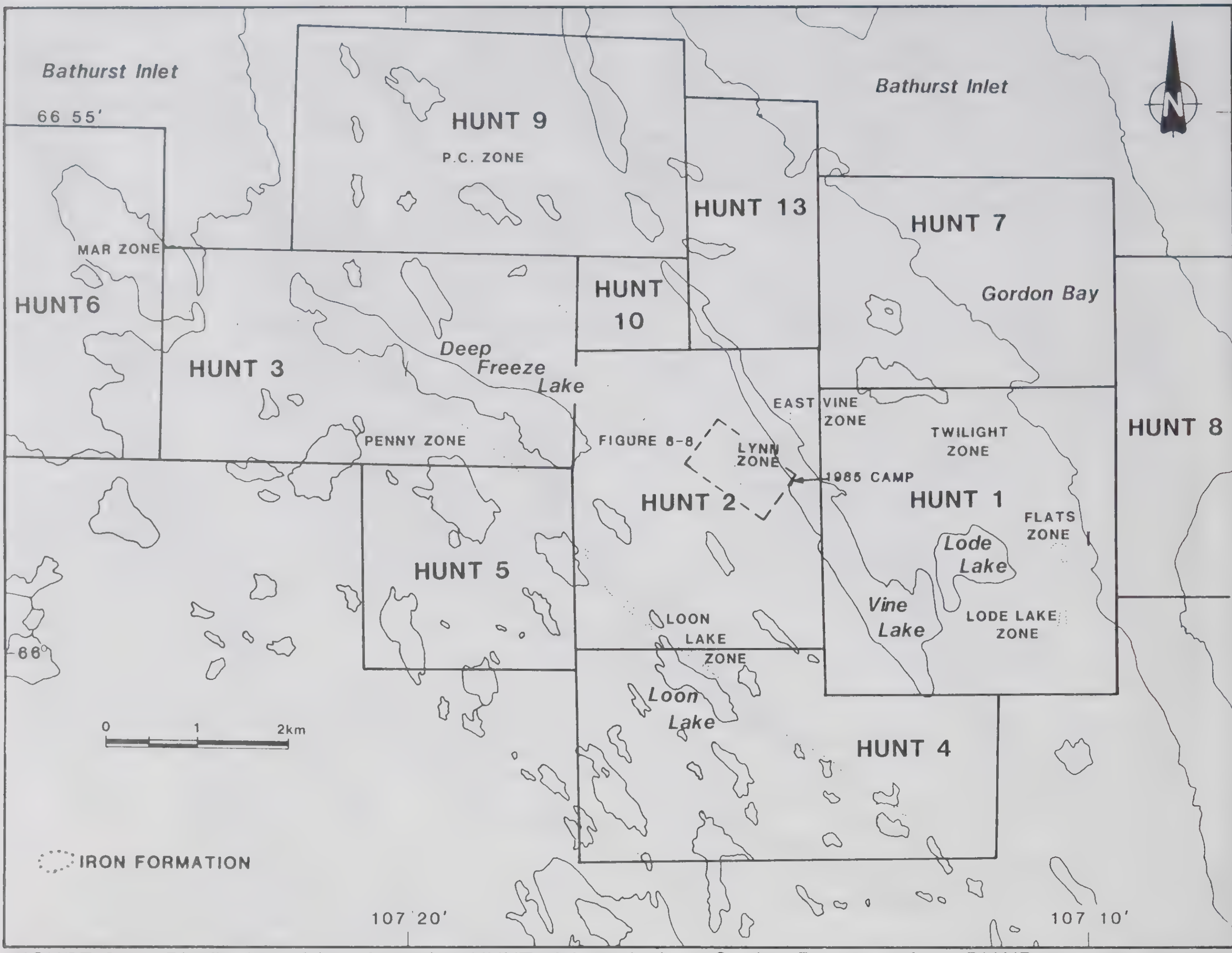


FIGURE 8-7: Distribution of iron formation HUNT claims, Andrew Gordon Bay area, from DIAND assessment report 082589.

Arsenopyrite is locally abundant and minor chalcopyrite was seen. Sulphide-facies iron formation, sample XR 15938 assayed 10.77 g/t Au over 0.25 m. Thirteen samples of complexly folded iron formation, which is up to 4 m wide, assayed from 0.07 to 10.77 g/t Au.

At B-10, grab sample XR 15735 of a 5 by 100 m lense of amphibolite assayed 12.27 g/t Au. The amphibolite contains pyrite (15-20%), pyrrhotite (5%) and arsenopyrite (5%) are all present.

1985: In the summer of 1985, 1305 samples were collected, numerous gold showings identified, and an additional 11 HUNT claims were staked (Tables 8-1 and 8-2; Figs. 8-2 and 8-7). Grids were established over the two most promising areas, the Lynn zone (HUNT 2) and the Penny zone (HUNT 3), and detailed geologic mapping, VLF EM and magnetic surveys were undertaken.

The Lynn zone (HUNT 2, Fig. 8-7) is an auriferous zone of iron formation, trending at Az 130° and dipping 65° to the northeast. The iron formation varies from 1 to 2 m wide in the south to as much as 40 m in tightly folded outcrops. A 10 m wide, unmineralized shear zone, trending Az 070° with dextral displacement, truncates the iron formation at two places on the grid. The 1:500 scale grid mapping distinguished the following mappable units: silicate-facies, sulphide-rich, sulphide-poor, and oxide-facies iron formation, biotite schist, biotite quartzite and diabase.

The strongest magnetic anomaly (up to 1600 gammas) is due to folded oxide-facies iron formation. The remaining anomalies are thought to represent thin bands of magnetite in sulphide-poor iron formation. The sulphide-rich iron formation does not give a significant magnetic response. A VLF EM conductor near the southeastern end of the grid may be due to a combination of conductive overburden and sheared bedrock. A 0.5 m wide shear zone with graphite was found in hole L-85-06 at 12 m depth.

TABLE 8-1: HUNT CLAIMS - 1985 sample distribution

CLAIM	ZONE	GRAB	CHIP	TOTAL
HUNT 1	Lode Lake + Flats	53	29	82
	Twilight	105	-	105
		2	2	4
HUNT 2	Lynn	216	136	352
	Loon Lake	35	30	65
	East Vine	24	6	30
HUNT 3	Penny	174	288	462
HUNT 4		18	-	18
HUNT 5		10	-	10
HUNT 6	Mar Zone	28	2	30
HUNT 7		18	2	20
HUNT 8		1	1	2
HUNT 9	P.C. Zone	32	2	34
HUNT 10				
HUNT 11				
HUNT 12		31	13	44
Miscellaneous Samples		44	-	44

TABLE 8-2: HUNT GOLD SHOWINGS AND ASSAY HIGHS

Zone	Strike Length	Average Thickness	High Grab	High Chip
Lynn	3.5 km	10 m	167.8	23.63/0.9 m
Penny	4.4 km	4-6 m	64.73	36.00/1.0 m
Lode Lake	800 m	2-3 m	35.49	5.14/1.3 m
Flats	200 m	4 m	13.7	9.60/1.2 m
East Vine	400 m	4-5 m	8.57	5.21/0.9 m
Twilight	800 m	2-3 m	17.45	-
P.C.	2 km	3-4 m	4.05	3.45/0.5 m
Mar	1 km	10 m	12.51	-
Hunt 12	800 m	10 m	10.46	-
Loon Lake	5 km	3 m	44.74	-

Two highly anomalous grab samples (168 and 121 g/t Au) were collected from sulphide-rich iron formation exposed along a cliff. Follow-up chip samples taken across of iron formation showed five areas of anomalous gold. Four of these areas were drilled. In all 656.9 m were drilled in 7 holes (Fig. 8-8). All seven holes intersected the Lynn zone iron formation over calculated true widths of 5 to 30 m. This iron formation is typically well-banded and predominantly silicate- and sulphide-poor facies. Mineralized sections are randomly distributed with no obvious alteration or structural relationship. Visible gold was observed in L-85-01 with arsenopyrite in a quartz vein, with a grunerite-rich band in L-85-02, and with chlorite and arsenopyrite in L-85-06. Intersections greater than 2 g/t Au are listed in Table 8-3.

Gold is concentrated in relatively thin sulphide-rich iron formation and quartz veining. The sporadic distribution of anomalous chip sample results and poor drilling results indicate lateral and vertical discontinuity of the mineralized zones.

The Penny zone (HUNT 3, Fig. 8-7) is a 40 to 80 m wide unit, containing several horizons of iron formation intercalated with clastic metasediments. It trends east southeasterly along the southern side of Deep Freeze Lake and dips about 50° to the north. This unit can be traced readily for more than 10 km, to the west it forms the Mar zone (HUNT 6) and to the southeast the Loon Lake zone (HUNT 2 and 4, Fig. 8-7). The southernmost iron formation is 3 to 7 m thick and forms a low, but fairly steep southward facing cliff along most of its length. This iron formation contains several gold showings. Gold assays greater than 2 g/t are mainly found in sulphide-rich iron formation. However, not all sulphide-rich iron formation contains anomalous gold, and sulphide-poor iron formation may have anomalous gold. Oxide and silicate-facies iron formation are present in the grid area as well.

A magnetic survey of the Penny grid helped to outline magnetic iron formation and diabase dykes.

Seven holes, totalling 556.2 m were drilled in the Penny zone iron formation. Mineralized sections in the Penny zone are within a silicified alteration zone. Visible gold was observed with arsenopyrite in sulphide-rich bands in holes P-85-01 and P-85-02. The best results are given in Table 8-3.

Several other zones were also identified by the 1985 reconnaissance sampling (Fig. 8-7; Tables 8-1 and 8-2). However, continuous chip sampling in the Lode Lake zone (B-9 zone of 1984), Loon Lake and P.C. zones failed to reproduce the anomalous results of grab samples and samples from three areas of a northeast-dipping iron formation in the Twilight zone (HUNT 1) gave anomalies assays for gold. A composite grab sample from the Mar zone (HUNT 6) assayed 12.51 g/t Au, but sulphide-rich iron formation is sporadic in this structurally complex area.

1986: In 1986 a small grid was set up on the Flats zone (HUNT 1), near the west shore of Gordon Bay (Fig. 8-7). Mainly sulphide-poor iron formation is interbedded with cordierite and andalusite-bearing metasediments. A 61,000 gamma magnetic anomaly corresponds to a fold nose in pyrrhotite and arsenopyrite-rich iron formation. This zone has very anomalous gold content, but the iron formations are thin and have low tonnage potential.

All but the HUNT 1 and 2 claims have lapsed.

TABLE 8-3: HUNT CLAIMS - 1985 Drilling Results (Intersections greater than 2 g/t Au)

D.D.H.	Interval (m)	Width (m)	Au (g/t)
Penny Zone			
P-85-01	51.21 - 53.08	1.87	2.02
	56.86 - 57.88	1.02	2.23
P-85-02	52.25 - 52.7	0.45	3.12
P-85-03	45.25 - 46.0	0.75	0.55
P-85-04	39.5 - 40.6	1.10	3.07
	45.0 - 45.75	0.75	3.94
P-85-05	78.3 - 78.9	0.60	2.06
P-85-06	41.6 - 42.15	0.55	8.26
	45.85 - 46.7	0.85	6.18
P-85-07	59.35 - 59.85	0.50	2.85
Lynn Zone			
L-85-01	27.15 - 30.0	2.85	9.12
incl.	27.15 - 27.8	0.65	29.48
	35.50 - 35.8	0.3	2.09
L-85-02	28.95 - 29.95	1.00	4.22
L-85-03	23.10 - 24.1	1.00	2.06
L-85-04	40.50 - 41.05	0.55	1.75
L-85-05	57.40 - 57.7	0.30	2.13
	59.85 - 62.8	2.95	4.74
L-85-06	26.50 - 57.9	1.40	3.08
L-85-07	34.60 - 35.6	1.00	6.82

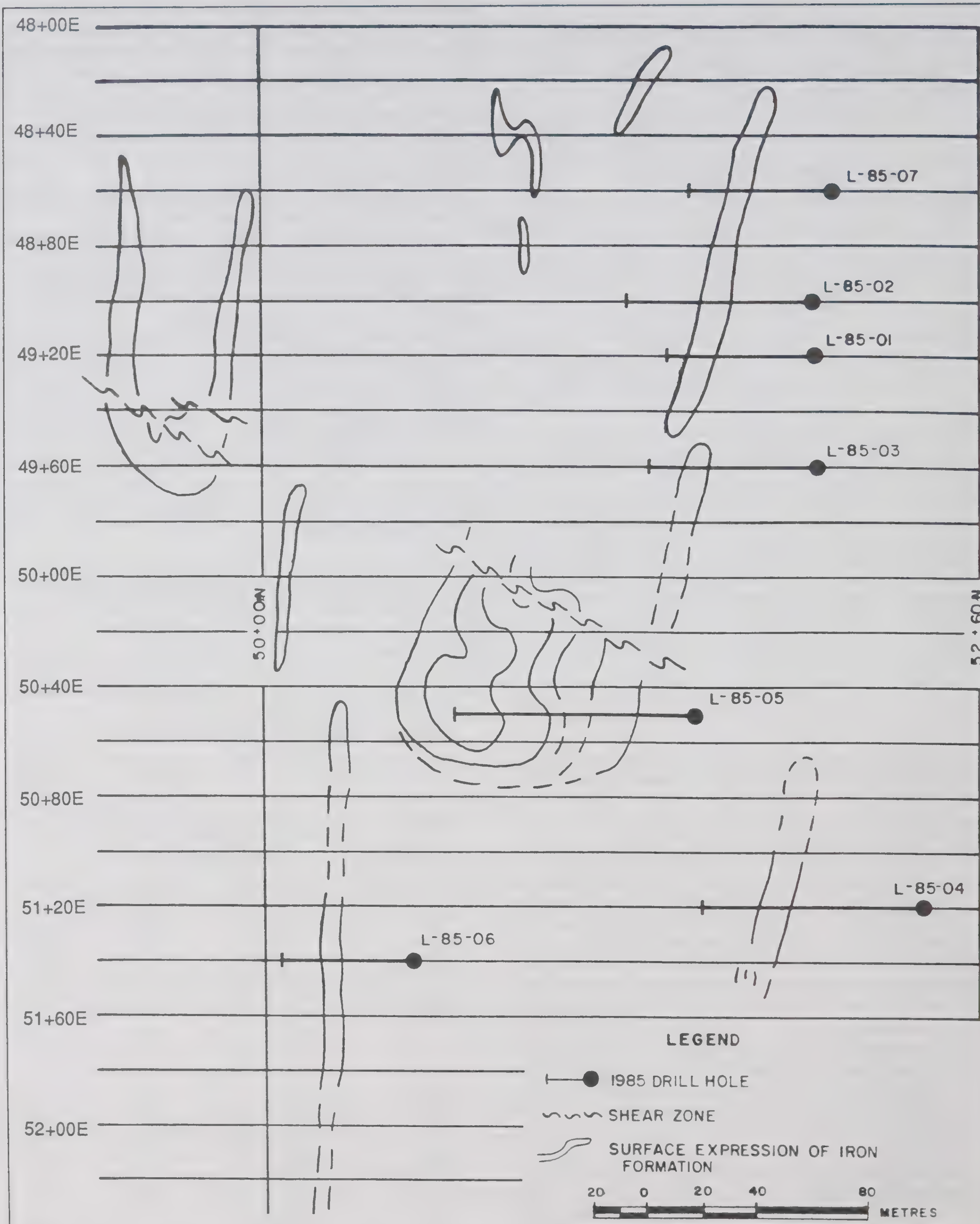


FIGURE 8-8: Lynn zone (HUNT 2) 1985 drill hole locations, from DIAND assessment report 082589.

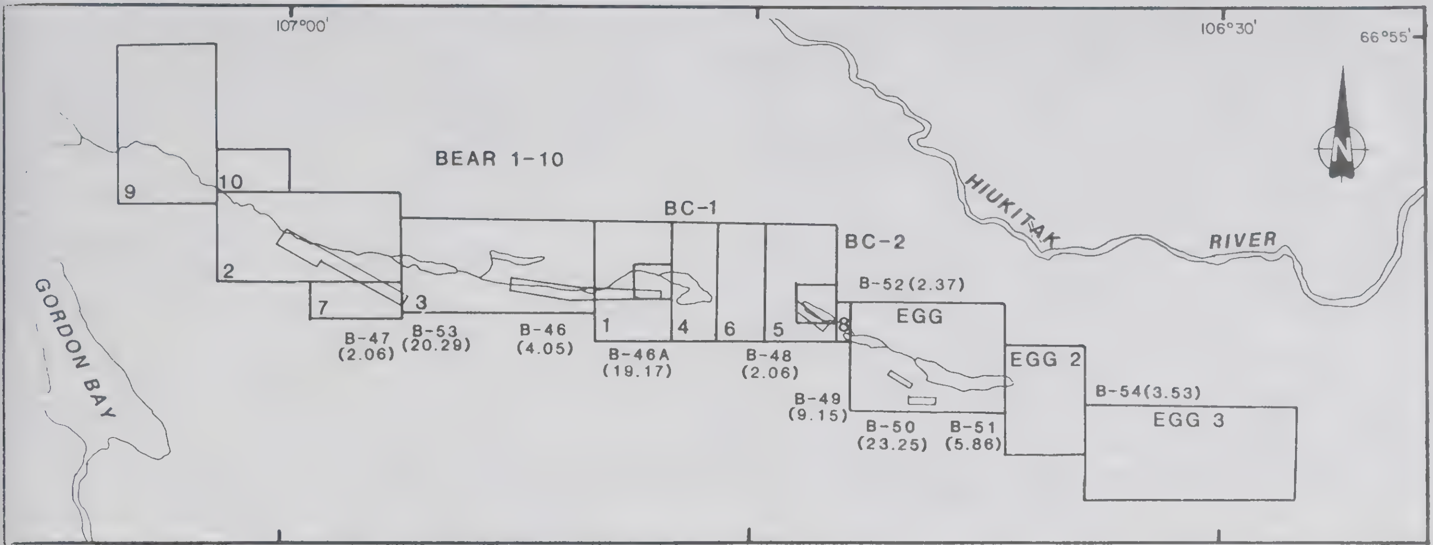


FIGURE 8-9: 1985 gold showings on the BEAR, BC AND EGG claims

BEAR AND EGG CLAIMS

Echo Bay Mines Ltd.	Gold
354 Granville Square	76 J/14-16
200 Granville St.	66°50-54'N,
Vancouver, B.C., V6C 1S4	106°30'-107°07'W

REFERENCES

Thompson (1986); Thompson *et al.* (1985, 1986).
DIAND assessment reports: 082557, 082558, 082559.

PROPERTY

BEAR 1-10 (4658 ha), EGG 1-3 (2465 ha).

LOCATION

The BEAR and EGG claims extend east-southeast from Gordon Bay, Bathurst Inlet for a distance of 30 km (Fig. 8-2, 15, 16 = EGG and 19-23, 25 = BEAR). They trend along the straight valley of 'Bear Creek' and adjoin the HUNT claims to the west and the LB and BL claims to the southeast.

HISTORY

Thompson (1986) mapped two quartz-garnet amphibolite gossans in 'Bear Creek valley'. These were staked by Bear Creek Hills Estate Ltd. as the BC 1 and 2 claims, recorded in March 1985. Helicopter traverses, by Echo Bay Mines Ltd. in late May 1984, led to the discovery of several additional gold showings in Bear Creek valley. The BEAR and EGG claims that cover the remainder of Bear Creek valley were recorded between July and October 1985 by Echo Bay Mines Ltd. of Edmonton.

DESCRIPTION

Thompson (1986) and Thompson and others (1985, 1986) mapped a migmatite isograd, roughly parallel to Bear Creek (Fig. 8-2), with sillimanite schist and gneiss to the south and sillimanite migmatite to the north.

Bear Creek valley is bounded by steep cliffs to the north and rugged slopes to the south. Relief up to 100 m is common in the valley. Gold is associated with lenses of sulphide-rich lenses of iron formation, which in turn is associated with quartz veins. Sulphides may be pyrrhotite, pyrite, arsenopyrite or loellingite. Some sulphide-poor iron formation also contains gold.

CURRENT WORK AND RESULTS

1985: Helicopter reconnaissance geochemical prospecting led to the identification of numerous gold showings along a belt of iron formation along the 'Bear Creek valley' and the BEAR and EGG claims were staked to protect the area (Fig. 8-9). Grids with 40 m spacing were set up over the main structures: the Falcon grid (BEAR 3 and 1), the Eagle grid (BEAR 3, 2 and 7 claims), the EGG main zone and EGG no. 2 on the EGG claim. Magnetometer surveys, 1:2000 scale mapping and phase II sampling were done on the grids.

Additional sampling returned assays of 18 and 24.34 g/t Au from the central Falcon grid and 42.9 g/t across 0.7 m, plus numerous grab samples above 20 g/t Au in the eastern part. A third area of interest within 200 m of the BC 1 claim produced assays up to 61 g/t Au.

Numerous samples collected along the entire length of the Eagle Grid (66°52'N, 107°W) assayed from 2 to 6 g/t Au. Higher results 10 to 30 g/t Au are associated with sulphides, which appear to be related to quartz veining. Anomalous gold was found 200 m west of the Eagle Grid and the zone probably continues westward under overburden.

Magnetometer surveys of the grids helped to establish the continuity of the iron formation in areas of overburden. Lower magnetic anomalies on the Eagle Grid are attributed to lower magnetite content in this area.

A second iron formation north of Bear Creek valley is not gold bearing. In all 720 grab or continuous chip samples were collected in phase I and II geochemical sampling.

Several other showings were identified and evaluated in 1985 (Fig. 8-9).

B-46: This showing corresponds to the Falcon Zone. A total of 163 samples were collected along this zone.

B-46A: This anomaly coincides with the eastern extension of the Falcon Zone onto Glen Warner's BC-1 claim. The first sample XR-9203 assayed 19.17 g/t Au. The iron formation trend across BC 1 is consistent with widths, strike lengths, and mineralization found in the Falcon Zone.

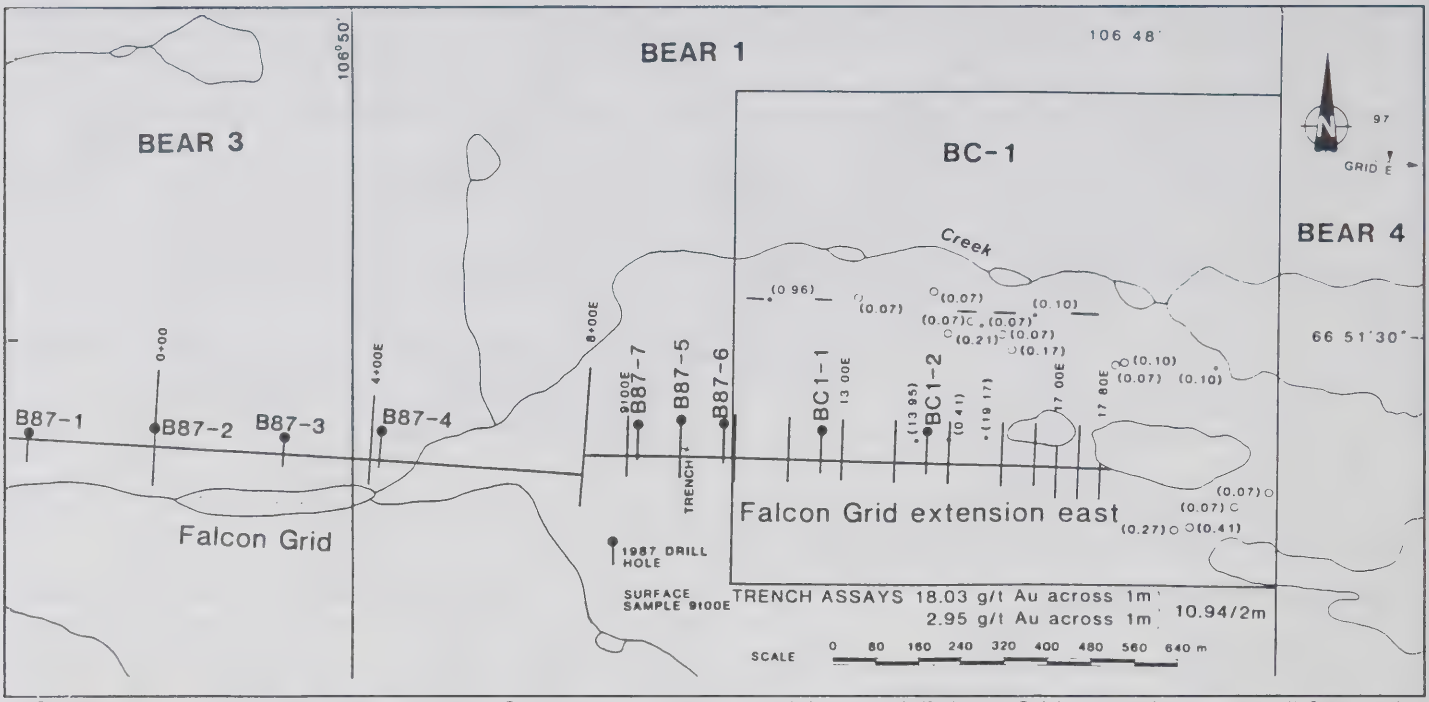


FIGURE 8-10: 1987 drill holes Falcon Grid (BEAR 1 and 3) claims and Falcon Grid extension east - BC 1 claim, from DIAND assessment report 082557.

B-47: This is predominantly an oxide/silicate iron formation which strikes for 1.5 km along the southern edge of the lake at the BEAR 2 and 3 boundary. Twenty-six samples were collected from this horizon which reached widths up to 3 m. Two initial samples assayed 2.0 to 2.5 g/t Au from the western portion. In the eastern portion, XR 19485 and 19490 were taken on a second pass from sulphide-rich lenses (pyrite and arsenopyrite) and assayed 2.40 and 4.73 g/t Au respectively. This could represent a western extension of the Falcon Zone.

B-48: This showing was discovered by helicopter traverse just west of Warner's BC 2 claim. Sample XR-14291 assayed 2.06 g/t Au. The iron formation is predominantly silicate/oxide in composition. There are trace sulphides in small lenses. Not much is known about its length or width.

B-49: This showing consists of several poddy iron formation lenses in the range of 1 to 2 m width and 5 to 15 m strike length. Samples XR-20303, 04 and 06 assayed 9.15, 3.98 and 3.36 g/t Au respectively. The lenses strike from BC 2 through BEAR 8 and onto the EGG claim.

B-50: This showing corresponds to "Zone 2" on the EGG claim. A well-exposed silicate- oxide-facies iron formation, with an average width of 2 to 3 m and well developed folding, strikes east-southeasterly for 700 m. Forty-nine samples were collected. Sample XR-20176 taken adjacent to a quartz vein with arsenopyrite assayed 11.01 g/t Au. Sample 20189 (21.36 g/t Au) was taken from float, and upon re-examination did not resemble the iron formation in bedrock. A baseline, 700 m long at A_2 107°, was set up.

B-51: This showing corresponds to the "Main zone" of the EGG claim. It is a 10 to 30 m wide zone of iron formation/quartzite gossan which stretches for 1.5 km and is readily visible from the air. Pyrrhotite and pyrite are common, ranging up to 20%. Approximately 75 samples are collected from various horizons within the zone. Samples XR-20231 and 33 assayed 2.78 and 5.66 g/t Au respectively. They come from a silicified pyrite-rich lens along the southern edge of the structure.

B 52: This showing is in discontinuous iron formation that trends into an oxide iron formation in the BC 2 claim. It is sulphide-poor iron formation with occasional pyrite-rich lenses. Of approximately 20 samples collected, only XR-20325 had an anomalous assay, 2.37 g/t Au.

B-53: This showing corresponds to the Eagle zone. A total of 202 samples was collected on this zone.

B-54: This showing is in very poorly exposed, southeasterly striking silicate iron formation in felsenmeer/boulders and outcrop. It has a length of 400 m and observed widths to 2 m. A total of 10 samples was collected. The high assay received was for sample XR-18906 (3.53 g/t Au), taken from a group of boulders/felsenmeer. Additional iron formation to the southeast contained very impressive sulphides locally. Strong shearing has occurred in this area and the possibility of north-striking trends are present as well.

1986: Areas of interest on the Falcon grid and the Falcon grid east extension were covered with fill-in magnetometer work. About 20 composite grab and continuous chip samples were collected. A trench was excavated 200 m west of the BC 1 claim. Samples from this trench assayed 18 and 2.6 g/t Au over 1 m. The highest gold content is related to sulphide-bearing iron formation.

Similar work was done on the EGG claim, but no work was done on the Eagle grid in 1986.

1987: In 1987 the BC 1 and 2 claims were optioned and the magnetometer, mapping and sampling was extended to cover this area.

Seven holes (455 m) were drilled on the Falcon grid and extension (BEAR 1 and 3) and two (142 m) on the BC 1 claim to test the gold potential of the iron formation at depth (Fig. 8-10). Three holes intersected narrow bands of sulphide-rich iron formation: B87-2 (7.54 g/t Au across 1.47 m), B87-4 (3.16 g/t Au across 2 m), and B87-5 (contains 5% sulphides with 5.97 g/t Au over 7.45 m including 30.8 g/t Au across 1 m). The other holes intersected very narrow zones of sulphide-poor iron formation or weakly mineralized migmatic schist.

BC 1 and 2 CLAIMS

Bear Creek Hills Estate
P.O. Box 820
Yellowknife, NWT, X1A 2N6

Gold
76 J/15
66°52'N
107°43' & 49'W

REFERENCES

Thompson (1986).
DIAND assessment report: 082557.

PROPERTY

BC 1 and 2.

LOCATION

The claims are centred on garnet-amphibolite-gossans (Thompson, 1986) and are 14 and 18 km east of Gordon Bay and 5 to 7 km south of the Hiukitak River (17 and 18 in Fig. 8-2).

HISTORY

The BC 1 and 2 claims were recorded in March 1985. In 1987 the claims were optioned to Echo Bay Mines Ltd.

DESCRIPTION

The BC 1 and 2 claims are underlain by gossans of iron formation (Thompson, 1986). The 1985 grab samples from BC 1 ranged up to 19.2 g/t Au.

CURRENT WORK AND RESULTS

1987: After the claims were optioned to Echo Bay Mines Ltd., the Falcon grid of the encircling BEAR 1 claim was extended eastward to include the southern half of the BC 1 claim. Another grid, the BC 2 grid was established in the southwestern portion of the BC 2 claim. Mapping and magnetometer surveys were done on these grids.

In late July, two holes (142 m) were drilled on the BC 1 claim (Fig. 8-10) to intersect iron formation below areas where surface grab samples and boulders of iron formation assayed in the range of 14.6 to 91.5 g/t Au. These holes intersected two units of iron formation. Hole BC 1-1 intersected 4.35 g/t Au over 1.0 m and hole BC 1-2 intersected 1.2 g/t Au over 1.15 m.

HOPE BAY VOLCANIC BELT

The Hope Bay volcanic belt (Fig. 8-11) is a steeply dipping syncline that extends at least 75 km S10°E from Hope Bay and averages 20 km in width (Fraser, 1964). It is a bimodal volcanic package of andesite pillow lava and felsic pyroclastic rocks. The lower two thirds of the section is dominated by andesite pillow lavas and metagabbro dykes and sills. The upper part or core of the syncline is characterized by a variety of felsic pyroclastic rocks with minor sediments (conglomerates, cherts, black shales, siltstones and reworked pyro-clastics) (Gibbins, 1987a,b). Near the top of the andesites, distinctive chocolate-brown weathering magnesium-rich komatiitic peridotites form sills that intrude the volcanic package in the areas northeast of Hope Bay (Gibbins and Hogarth, 1986).

The volume and diversity of felsic volcanics, as well as granite and felsite clasts in some of the conglomerates, suggest a granitic crust in the area at the time of volcanism. However, granites and granitic gneisses envelop the volcanic belt and generally appear to be younger.

Proterozoic topographic lows are indicated by outliers of basal Goulburn Group conglomerate and trough cross-bedded quartzite. Several large Franklin diabase dykes and sills form spectacular cliffs and ridges that dominate present-day topography, especially in the northern third of the belt.

The geology and mineral potential of the Hope Bay volcanic belt have been compared and contrasted with other Archean volcanic belts of the Slave Province and the Yilgaran block of Western Australia, as well as the well-documented Abitibi belt of the Superior Province. The north end of the belt is on tide-water and considered to have good potential for both precious and base metal deposits (Figs. 8-2 and 8-11).

Since 1964, the Hope Bay volcanic belt has been explored mainly for gold and silver, but also for base metals (Thorpe, 1966, 1972, pp. 110-120; Seaton, 1984, pp. 360-363; Seaton and Crux, 1985, pp. 307-315). Between 1973 and 1975, an estimated 3,900 kg of silver was produced from two high-grade veins near the northeast corner of the volcanic belt. (Padgham *et al.*, 1976, pp. 75-78; Gibbins *et al.*, 1977, pp. 227-228; Hurdle and Gibbins, 1978, p. 111; National Mineral Inventory).

In 1986, the author initiated 1:30 000 scale mapping of the northern Hope Bay volcanic belt (Gibbins, 1987a,b). The central and southern parts are to be mapped in 1988 and 1989. In 1987 and 1988, Abermin Corp. prospected gold-bearing shear zones in both greenstone and granite. This work resulted in the staking of several new claim blocks (Fig. 8-11).

HOPE BAY PROJECT

Abermin Corporation
Current owners:
CSA Management Ltd. and
Goldcorp Investments Ltd.
Toronto, Ont.

Gold
76 O/9,16; 77 A/3,6
68°09'N, 106°31'W

REFERENCES

Fraser (1964); Gibbins (1987a,b); Seaton (1984); Seaton and Crux (1985); Seaton and Hurdle (1979); Thorpe (1966, 1972).

DIAND assessment reports: 082611, 082639 and various other assessment reports for 77 A/3.

PROPERTY

Mineral Lease 2708 (RUS, WEL, VAN, CAT OX claims); WOG 1-3, WOIG 2, KOIG 1-8.
NOTE: the Wombat Showing and Ida Point Gold Showing are reported separately.

LOCATION

The claims are east of Hope Bay, between Roberts Lake and Ida Point and south of Hope Bay adjacent to the Koignuk River (Fig. 8-11). The area is 725 km northeast of Yellowknife and 125 km southwest of Cambridge Bay. Bay Chimo, a small Inuit community on Bathurst Inlet, is about 70 km southwest of Hope Bay.

HISTORY

Between 1964 and 1967, Roberts Mining Ltd. did considerable grass roots exploration in the Hope Bay volcanic belt, during which time they discovered and prospected several gold and silver showings (Thorpe, 1966, pp. 45-46 and 1972, pp. 110-120; Fig. 8-11). In 1967 the Hope Bay Syndicate, and later

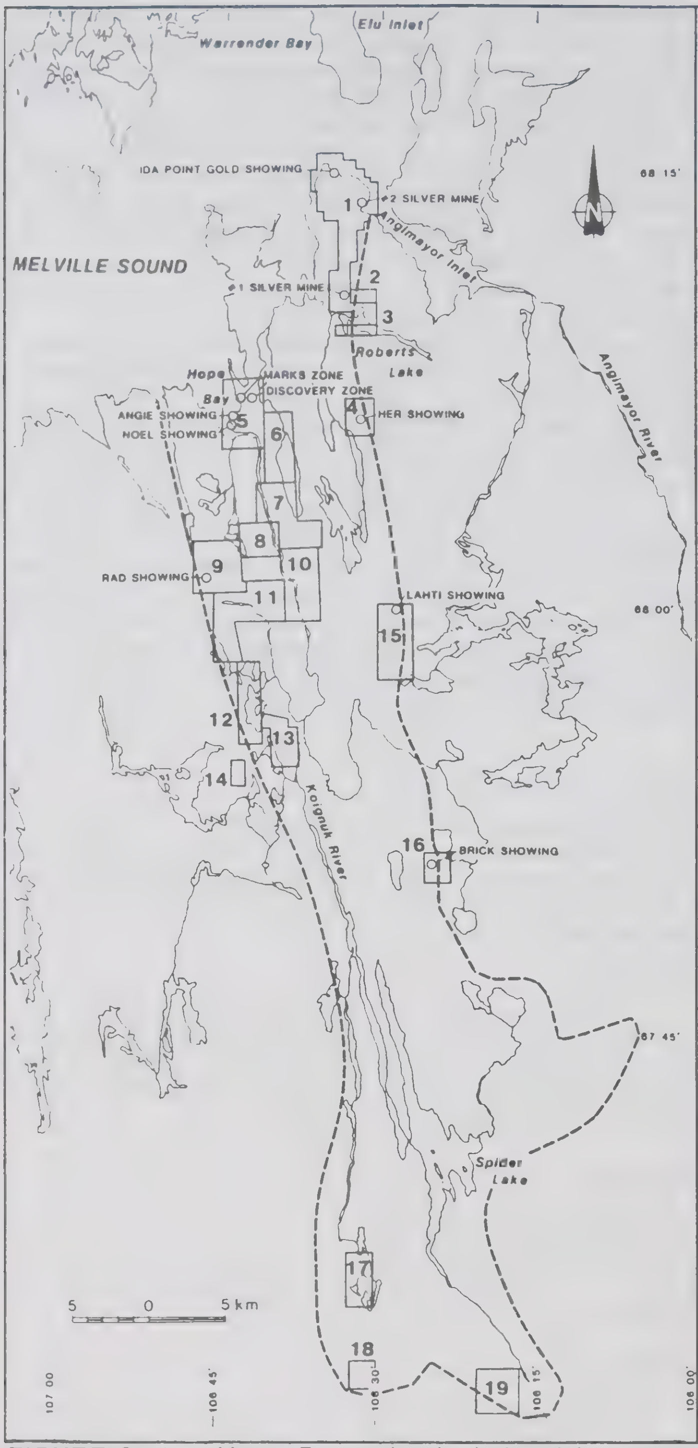


FIGURE 8-11: Hope Bay volcanic belt, claim groups and showings.

LEGEND

HOPE BAY VOLCANIC BELT

1	77A/3,6	MINERAL LEASE 2078	ABM
2	77A/3	WOG 1	ABM
3	77A/3	WOIG 2	ABM
4	77A/3	KOIG 2	ABM
5	77A/3	KOIG 1	ABM
6	77A/3	WOG 2	ABM
7	77A/3	KOIG 3,4	ABM
8	77A/3	WOG 3	ABM
9	77A/3	KOIG 5	ABM
10	77A/3,76O/15	COPE,DOK,LARK	NOR
11	77A/3,76O/15	BOK,BAK,CAN	IPM
12	76O/15	MEN,LYNX	IPM
13	76O/15	JON	IPM
14	76O/15	CHILL 1	NOR
15	76O/16	KOIG 6	ABM
16	76O/16	KOIG 7	ABM
17	76O/10	MERK 1,2	NOR
18	76O/10	SOU	NOR
19	76O/9	KOIG 8	ABM

ABM ABERMIN CORPORATION
NOR NORANDA EXPLORATION
IPM IDA POINT MINERALS

a series of successor companies, optioned the Hope Bay claims and drilled the more encouraging showings. Efforts were concentrated on two silver discoveries near Roberts Lake and Angimayor Inlet. An estimated 3,900 kg of silver was mined between 1973 and 1975.

In 1981, both Noranda Exploration Ltd. and Ida Point Minerals Ltd. had regional exploration programs in the area (Seaton, 1984, pp. 360-363). Noranda Exploration Co. Ltd. flew an Input (EM and magnetic) survey of the volcanic belt, and both groups staked numerous claim blocks.

During 1982-83 Noranda Exploration Co. Ltd. optioned the Ida Point Minerals/Lynx Canada Exploration Ltd. claims, established grids in favourable areas and did detailed geophysical surveys (Seaton and Crux, 1985, pp. 307-315). This work was directed mainly to the discovery of massive sulphide deposits.

Early in 1987 an interest in the Roberts Mining Co. mineral leases was optioned to Abermin Corporation. In addition, the KOIG 1-8 claims were staked to protect gold showings on open ground.

DESCRIPTION

The geology of the Hope Bay volcanic belt was described in the introduction to this section. Descriptions of individual showings are given in Thorpe (1966, 1972) and appropriate assessment reports. Most of the showings are indicated in Figure 8-11.

CURRENT WORK AND RESULTS

The objective of the 1987 field season was to evaluate the northern part of the Hope Bay volcanic belt where previous prospecting was concentrated and the exposure is best. This area includes the Roberts Lake mining lease, containing two former silver producing zones (#1 and #2, Fig. 8-11). The work included resampling all gold showings and prospecting for extensions and other mineralized zones. Several mineralized areas were identified, but most of the detailed work was done at the Wombat showing and the Ida Point gold showing, which are described in separate write-ups.

In addition to work on these showings, the areas north and south of the Wombat zone were prospected and sampled. The majority of samples were well-mineralized, but very little gold was found.

Discovery Zone: 68°06'40"N, 106°42'25"W

This zone is 2.3 km north of the rapids at the mouth of the Koignuk River. The showing was discovered by Roberts Mining Ltd. in the fall of 1964 and several trenches were excavated and sampled in the sixties. It is in a major shear zone estimated to be at least 300 m wide and traceable for 0.6 km along the regional north-trending strike of the volcanic country rocks. Gold is associated with a narrow (5 cm to 1 m wide), massive arsenopyrite-rich "vein" in the rusty shear.

Abermin Corporation's 1987 work extended the zone southwards for several hundred metres. The gold content of samples is moderately anomalous, ranging from 2 ppb to 15 g/t Au, and 0.02 to 17.2 g/t Ag. Arsenic content is highly anomalous and ranges from 25 ppm to 28%, but base metals (copper, lead and zinc) are low. A VLF EM-16 survey did not clearly define the arsenopyrite-rich structure, but numerous conductors were identified.

Her Showing: 68°06'30"N, 106°31'27"W

The Her Showing is on the eastern margin of the volcanic belt near the centre of KOIG 2 or 11 km south of Roberts Lake. In 1987 Abermin Corporation resampled pits, did a VLF EM-16 survey and prospected the surrounding area. Rock samples ranging from 46 ppb to 40.7 g/t Au and 0.87 to 665 g/t Ag are considered encouraging. Arsenic and base metal contents are low.

Two strong VLF EM conductors were recognized, but they do not appear to be related to the showing.

Lahti Showing: 68°00'N, 106°27'30"W

The Lahti Showing is in the northern portion of the KOIG 6 claim, near the intersection of 68°N and the eastern margin of the volcanic belt. The showing was explored by Perry River Nickel Mines Ltd. in 1976 (Seaton and Hurdle, 1979 p. 89). Abermin Corporation's 1987 assays range from 1.66 to 64.1 g/t Au and 2.3 to 69.7 g/t Ag.

Mark's Showing: 68°07'N, 106°44'W

In August 1987, Abermin Corporation geologist M. Hiltz discovered a new showing 1.0 km to the northwest of the Discovery zone at the base of the large peninsula jutting out into Hope Bay. This showing is a gossanous zone ranging from 0.3 to 1.0 m in width including a 0.13 m wide tabular quartz vein. The zone strikes at Az 176° to 210° and dips from 42° to 85°W and is exposed along strike for at least 40 m. The vein system is well mineralized carrying from 10 to 70% arsenopyrite, 10 to 60% pyrite, up to 5% iron-carbonate and 20 to 65% quartz. All samples from this showing were selected grab samples.

Assays for rocks collected from this zone range from 86 ppb to 7.24 g/t Au with 6 of the 10 rocks collected returning 7 g/t Au or better. Silver assays range from 2.30 ppm to 39.0 g/t giving this zone an average Au/Ag ratio of 0.66:1, comparable to the Lahti Showing at 0.87:1. Lead and zinc content is low with maximum assays being 137 ppm Pd and 330 ppm Zn. Copper is moderately anomalous returning assays ranging from 34 to 6200 ppm (0.62%). As expected arsenic assays are extremely high ranging from 643 ppm to 16.6%. No panned concentrates were collected at this location.

Rad Showing: 68°01'10"N, 106°46'51"W

This showing is in the southwest quarter of the KOIG 5 claim, near the western margin of the Hope Bay volcanic belt. It has been described as "a small but relatively high grade gold vein" (Thorpe, 1972, p. 117).

Abermin Corporation's assays for 7 samples ranged from 34 ppb to 29 g/t Au and 0.08 to 7.0 g/t Ag. The vein is considered too small to be economically significant, but it may be related to a large east-trending fault on the claim.

The **Brick, Lahtai South and Kennet Tarn-South** showings and rusty carbonate shear zones east of the lower Koignuk River were also sampled.

At the end of the 1987 field season, the WOG 1 and WOIG 2 claims were staked to extend mineral holdings in the vicinity of the Wombat zone at Roberts Lake. The WOG 2 and 3 were staked near Hope Bay to protect the 'Discovery Zone'.

WOMBAT (GRANITE) SHOWING

Abermin Corporation	Gold, Silver, Copper
Current owners:	77 A/3
CSA Management Ltd. and	68°10'12"N, 106°31'W
Goldcorp Investments Ltd.	
Toronto, Ont.	

REFERENCES

Fraser (1964); Thorpe (1972).
DIAND assessment report: 082611.

PROPERTY

Mineral Lease 2708 (WEL 1-7, CAT 1-4); WOG 1; WOIG 2.

LOCATION

The Wombat showing is on the north shore of Roberts Lake, just east of the entrance to a large circular bay. It is in the WEL 3 claim, 2 km southeast of the Roberts Lake or the Number 1 silver deposit (Fig. 8-11).

HISTORY

This showing was known as the 'granite showing' prior to 1987. It was trenched, mapped at 1:600 scale, and sampled by Roberts Mining in 1966. In 1967, it was mapped at 1:240 scale and resampled by the Hope Bay Syndicate. The best assays ranged from 15.1 to 100 g/t Au and 7.54 to 48.0 g/t Ag over 0.4 to 1.3 m (Thorpe, 1972, p. 115).

DESCRIPTION

The Wombat zone is in a prominent linear structure or shear zone that trends at Az 040°, varies from 2 to 12 m in length. The zone itself consists of quartz veins, granite and shattered granite plus unmineralized mafic dykes or schistose greenstone remnants, which are replaced by ferruginous carbonate. The country rock is fresh granite or granodiorite (Fraser, 1964). The veins and breccia contain minor pyrite and chalcopyrite and visible gold has been panned out of the crushed vein material.

CURRENT WORK AND RESULTS

A 500 by 80 m grid was established along the Wombat shear zone and the geology was mapped in detail. Chip samples showed favourable results: 3.2 m width of 11.6 g/t Au. Consequently, it was decided in mid-July that extensive trenching and sampling were warranted.

This second round of sampling was even more encouraging that the first. At trench 3, where the first samples were collected, a comparable series of samples assayed 18.2 g/t Au and 4.46 g/t Ag over 3.50 m. At trench 2, 35 m to the south, a 1.48 m interval assayed 67.9 g/t Au. It is separated from a second zone of 2.93 m of 5.6 g/t Au, by 2.97 m of weakly mineralized rock. At trench 1, a further 13 m south, two similar zones give a combined zone 7.22 m of 3.57 g/t Au. The gold to silver ratio of more than 40 samples averages a relatively constant 3:4. Several other promising zones were also found on the grid. Assays for trenches 1-3 are shown in Figure 8-12.

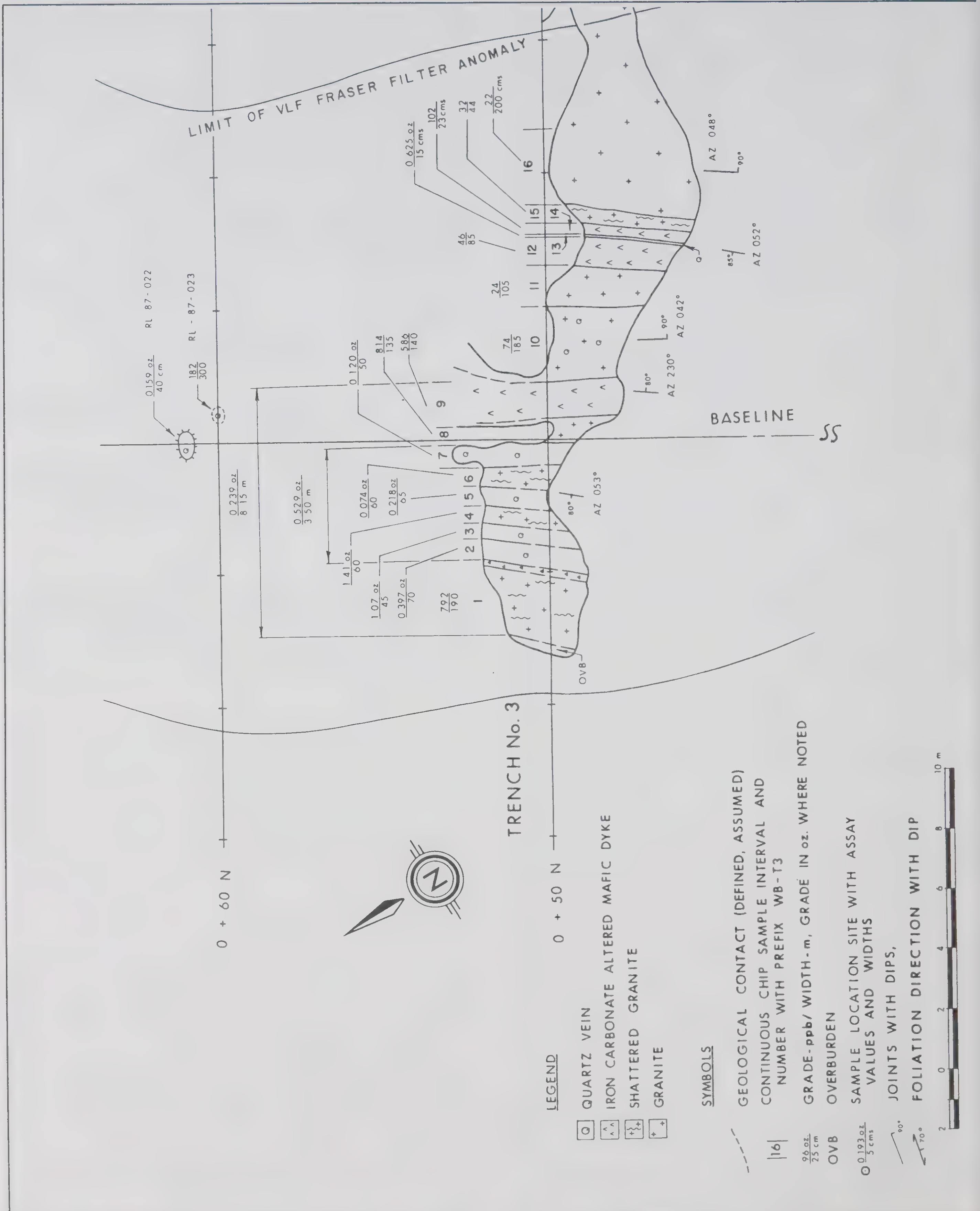
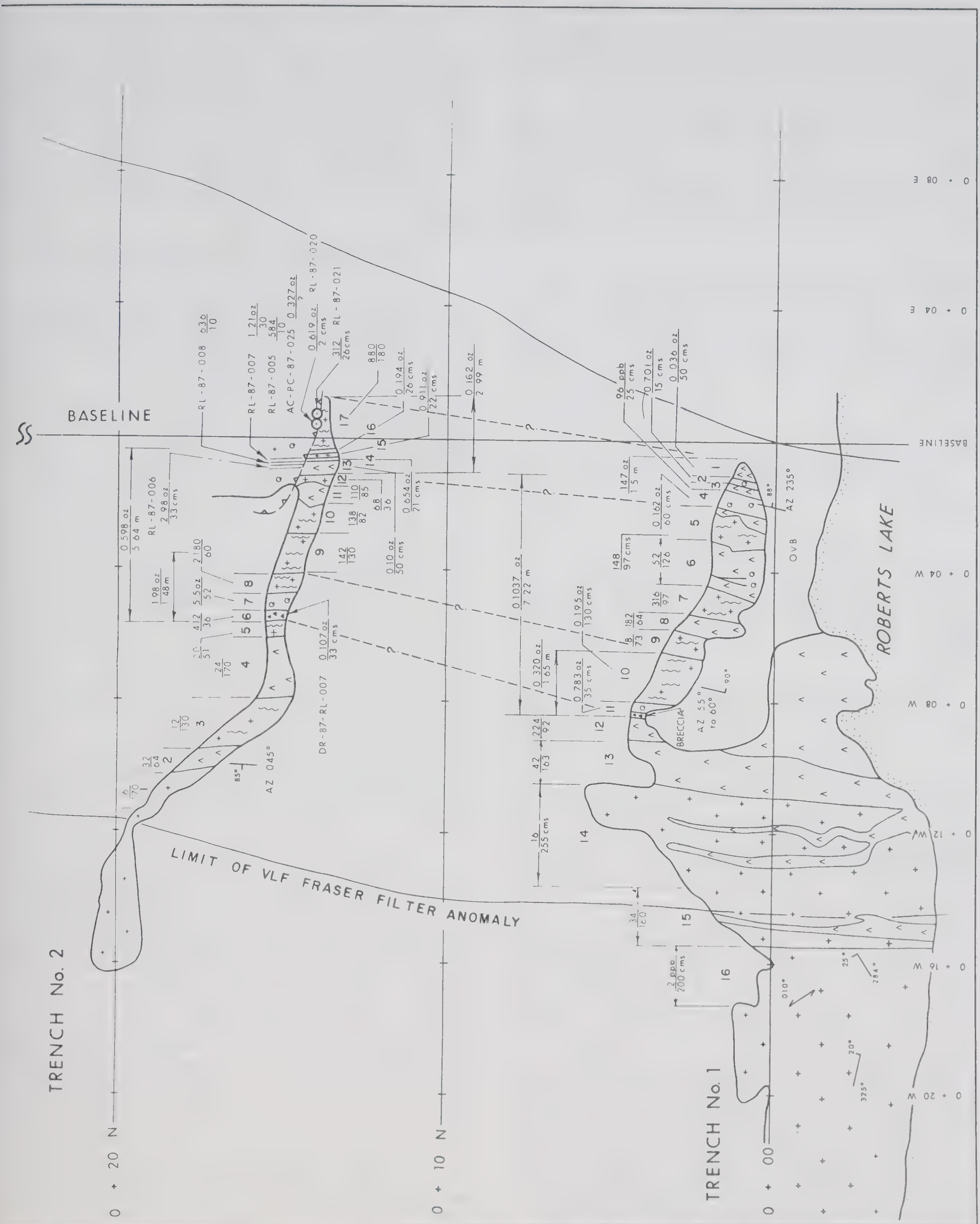


FIGURE 8-12: *Wombat zone with trenches and sample sites, from DIAND assessment report 082611.*


TRENCH No. 2
TRENCH No. 1
BASELINE
ROBERTS LAKE
LIMIT OF VLF FRASER FILTER ANOMALY
BRECCIA
OVB
AZ 045°
AZ 235°
DR-87-RL-007
RL-87-008
RL-87-007
RL-87-006
RL-87-005
AC-PC-87-025
RL-87-020
RL-87-021
0 + 20 N
0 + 10 N
0 + 00
0 + 08 E
0 + 04 E
0 + 04 W
0 + 08 W
0 + 12 W
0 + 16 W
0 + 20 W

In the Wombat shear zone, gold is continuous over at least 50 m and is open at depth and to the south under Roberts Lake.

Contoured VLF Fraser filter data and VLF profiles clearly show a weak but identifiable linear conductor, corresponding to the Wombat zone. In addition, several other conductors were outlined along the structure and elsewhere on the grid.

An orientation geochemical survey, of humus samples, demonstrated a strong correlation between gold and silver (Au:Ag = 3.3:1). Gold concentrations do not correlate with arsenic or copper enrichment, however the highest gold, arsenic and copper concentrations are all associated with quartz-rich material. There appears to be little or no correlation between gold and lead or zinc.

IDA POINT GOLD SHOWING

Abermin Corporation	Gold, Silver
Current owners:	77 A/6
CSA Management Ltd. and Goldcorp Investments Ltd. Toronto, Ont.	68°15'12"N, 106°34'W

REFERENCES

Thorpe (1972).
DIAND assessment report: 082611.

PROPERTY

RUS 1-4, part of mining lease 2708.

LOCATION

The Ida Point gold showing is 0.5 km southeast of the northern tip of Ida Point or 3 km northwest of the Number 2 or Ida Point silver mine (Fig. 8-11).

HISTORY

Numerous auriferous veins are reputed to have been discovered and staked by Archie Talbot and Ingie Bjornson, prospectors in the employ of Roberts Mining Ltd, in July 1966.

In 1967, the Hope Bay Syndicate optioned the property and excavated several pits, collected numerous samples and drilled 17 holes (165 m). Results were inconclusive to discouraging as the shallow drilling indicated that the quartz lenses containing the best gold are very irregular and discontinuous.

In 1980-81, Lynx Canada Exploration Ltd. optioned the claims from Ida Point Minerals and retained Derry Mitchener & Booth Consultants to explore the area.

DESCRIPTION

The showings are of gold-bearing quartz veins along shears in greenstone and to a lesser extent disseminated minerals in shears (Thorpe, 1972, p. 111). The volcanic rocks have been cut by shears in random directions. Some shears have been traced for up to 300 m, although displacement by crosscutting shears makes continuity conjectural in some cases.

> The shear zones generally are host to quartz veins ranging up to about 10 feet in width. A number of the veins consist of fine-grained sugary white quartz with arsenopyrite-rich bands along their margins. In part the arsenopyrite is very fine grained and in part it is in small needle-like prismatic crystals. The arsenopyrite probably carries most of the gold values where the veins are narrow, but in the wider veins small specks of visible gold are common in this type of quartz. The arsenopyrite bands along the vein margins have in some cases formed by partial replacement of the sheared wall-rock. (Thorpe, 1972, p. 111)

CURRENT WORK AND RESULTS

In 1987, Abermin Corporation geologists resampled several pits and panned material from highly altered shear zones. In general gold content was high (up to 45 g/t), but silver was low, averaging less than one tenth the gold content. Pan concentrates ranged from 13.2 g/t to 1481 g/t Au. Arsenic in these concentrates is also high (0.19% to 11.1%), but copper, lead and zinc content is generally low.

Systematic sampling, mapping, magnetometer, VLF EM and geochemical surveys are recommended in order to identify new drill targets.

HIGH LAKE SUPRACRUSTAL BELT

The High Lake supracrustal belt (Easton *et al.*, 1982) is part of a northerly trending complex of mainly volcanic rocks, intruded to the west by extensive granitic plutons and flanked to the east by volcaniclastic, carbonate and turbidite sediments, and intrusive granitoid rocks.

HOOD PROPERTY

Cominco Ltd.	Gold
Suite 700, 409 Granville St.	76 L/10
Vancouver, B.C., V6C 1T2	66°30'-66°37'30"N
	110°30'-110°59'W

REFERENCES

Fraser (1964); Jackson *et al.* (1986b); Seaton (1978).
DIAND assessment reports: 018788, 019502, 060671, 060819, 061345, 061407, 061408, 061873, 082096.

PROPERTY

SGJV 1; Prospecting Permit 1031; VER 1-4.

LOCATION

The property is 485 km northeasterly of Yellowknife, and 35 km north of Kathawachaga Lake. The northern boundary of Prospecting Permit 1031 is 25 km south of the Hood River.

HISTORY

Documented exploration by mining companies of the 76 L/10 area started in 1968. Exploration by Borealis Exploration Ltd. in 1968 and 1969 and later by Long Lac Mineral Exploration Ltd. as Prospecting Permit 337 in 1974 and 1975 (Seaton, 1978) is reported in DIAND assessment reports 018788, 019502, 060671, 060819, 061345, 061407, 061408, 061873. Work included geological mapping at 1:31 680 and locally at larger, more detailed scales, a helicopter-borne EM, magnetometer and radiometric survey, fixed wing AEM and magnetometer (Input surveys), and prospecting. Though samples were, in most cases, assayed for gold as well as silver, zinc and copper, emphasis was on exploration for massive sulphide. Long Lac Mineral Exploration was the first to discover gold in the property area (DIAND assessment report 061345). Apart from a brief re-evaluation of the southern part of 76 L/10 by Noranda Exploration Company Ltd., no work was done in the property area until the mid-1980's when auriferous iron formation became the primary exploration target. Following one day of prospecting, Trigg Woollett Olson Consulting Ltd. recorded SGJV 1 for the Slave Gold Joint Venture in

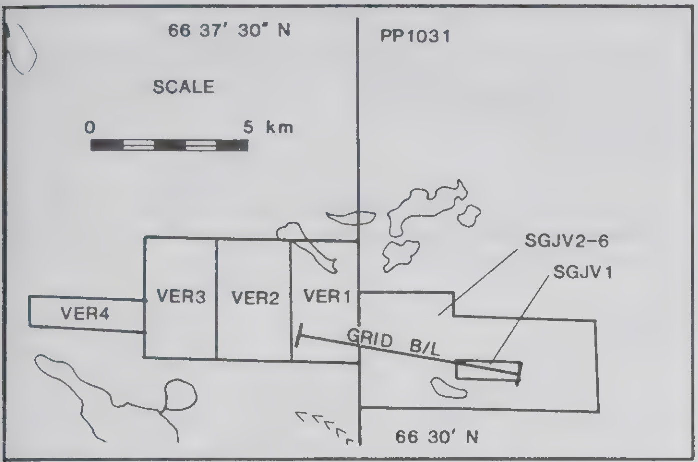


FIGURE 8-13: SGJV and VER claims and Prospecting Permit 1031 claims and grid.

September 1984 to cover a gold showing and were granted Prospecting Permit 1031 in February 1985. In November 1985, Cominco Limited recorded VER 1-4, and in September 1987, SGJV 2-6 to secure parts of Prospecting Permit 1031 which lapsed in 1988. SGJV 1, Prospecting Permit 1031 were optioned by Cominco in early 1986 from the Slave Gold Joint Venture. Cominco abandoned their option in 1987. By 1988 VER 1 and 2 (Fig. 8-13) had lapsed.

DESCRIPTION

As part of a widespread reconnaissance between 65°N and 69°N, 100°W and 112°W, Fraser (1964) mapped the property area at 1:506 880. This helicopter reconnaissance was the first published geological mapping covering 76 L/10. The Hood Property is mainly underlain by mafic intermediate and felsic volcanics, Yellowknife Supergroup metasediments and granitic, locally pegmatitic intrusive rocks. All except the northeastern part of 76 L/10, which is underlain by granitic rocks, was mapped at 1:63 360 by Johnson and Robinson in 1974 (DIAND assessment report 081345) for Long Lac Mineral Exploration. Jackson and others (1986b) mapped 76 L/10 at 1:30 000. On the Hood Property bedding and schistosity have a westerly to northwesterly trend. Northwesterly trends are in the northwestern part of the property where the strike is transitional to northerly (outside the property) and in the eastern part of the property where a tight fold with a northwesterly striking axial plane has been mapped (DIAND assessment report 081345). Metasediments locally contain cordierite and garnet. Units of silicate and sulphidic amphibolitic iron formation and of graphitic argillite have been mapped on the property. Volcanics and overlying sediments young generally to the south.

CURRENT WORK AND RESULTS

In 1986 a grid was constructed, with an 8-km-long baseline extending west-northwesterly from the south-central part of Prospecting Permit 1031 and the SGJV 1 claim to the southern part of the VER 1 claim (Fig. 8-13). The grid was geologically mapped at 1:5000. Six iron formation-hosted gold showings were mapped, of which four (Nos. 1,2,5,6 showings) in the eastern part of the grid (on the SGJV 1 claim) were selected for detailed work. This included 1:2 500 geological mapping of that part of the grid covering the four eastern showings and 1:500 mapping of the complexly folded No. 1 showing. Magnetometer and horizontal loop EM over the four eastern showings showed each to coincide with weak conductors and locally magnetic anomalies. Northwesterly trending diabase dykes also give rise to magnetic features.

In 1987 gold showings on SGJV 1 were tested by eight diamond drill holes totalling 607 m.

BLACKRIDGE AND BR CLAIMS

Aber Resources Ltd.	Gold
700, 1177 W. Hastings St.	76 L/15
Vancouver, B.C., V6E 2K3	66°52'N, 110°52'W

REFERENCES

Fraser (1964); Jackson *et al.* (1986b); Seaton *et al.* (1987).
DIAND assessment reports: 018788, 019502, 060671, 060819, 061408, 061873, 082273.

PROPERTY

BLACKRIDGE 1; BR 1, 2.

LOCATION

The property is roughly 520 km north-northeasterly of Yellowknife and 3 km northwest of the Hood River.

HISTORY

BLACKRIDGE 1 was recorded in September 1983 and BR 1 and 2 in October 1985. Borealis Exploration Ltd., which explored NTS area 76 L/15 from 1965 to 1970, by airborne and ground geophysical surveys, discovered and trenched the gold showing currently staked as BLACKRIDGE 1 (DIAND assessment reports: 018788, 019502, 060671, 060819, 061408, 061873). Noranda Exploration Company did airborne geophysics and ground follow-up over the area in 1981.

DESCRIPTION

The claims are in the southern part of the High Lake supracrustal belt. The area was mapped at 1:506 880 as part of a widespread geological reconnaissance by Fraser (1964). More recently the area has been mapped at 1:50 000 by Jackson and others (1986b), who show the property area to be underlain by north-northeasterly striking greywacke/sandstone of greenschist facies and their amphibolite-grade equivalents in the northwestern part of the claim block. In the northwestern part of the property the sediments contain abundant amphibolite layers and are cut by a sill-like body of massive amphibolite, to the northwest of which metasediments and pillowed mafic volcanics outcrop (Fig. 8-14).

CURRENT WORK AND RESULTS

A grid was constructed in the central part of the BLACKRIDGE 1 claim with a north-northeasterly baseline 600 m long and roughly coincident with the contact between gabbro, presumably the massive amphibolite mapped by Jackson and others (1986b), and a belt of recessive, largely overburden-covered metasediments. Bedding in the metasediments dips steeply to the southeast as does foliation in both gabbro and sediments (DIAND assessment report 082273).

In 1985 an altered and locally brecciated zone within gabbro (amphibolite) or at the metasediment-gabbro contact was tested

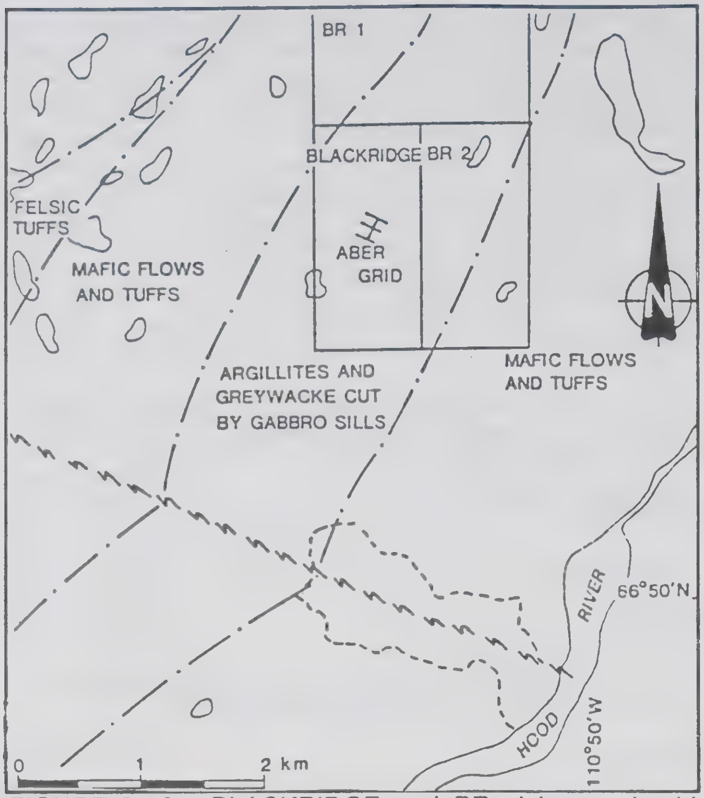


FIGURE 8-14: BLACKRIDGE and BR claims and grid. Geology, from DIAND assessment report 082273.

by six diamond drill holes. Alteration, including silicification, chloritization and carbonatization, together with increased biotite and amphiboles, is accompanied by concentrations of arsenopyrite, pyrite, pyrrhotite and locally gold. The best drill intersection assayed 11.4 g/t Au across 1.07 m, from an arsenopyrite- and pyrite-rich zone in gabbro.

Metasediments penetrated in drilling were hornfels and phyllite.

WILBERFORCE BASIN

The "Wilberforce Basin" is an irregularly shaped area of metasediments extending from the James River in the north across the Hood River, to the Booth River in the south. Wilberforce Falls lies just east of, and outside, the area underlain by the metasediments of the basin.

WILBERFORCE BASIN AIRBORNE SURVEY

Silver Hart Mines Ltd.	Gold
320 Sioux Rd.	76 K/13,14; 76 N/2,3
Sherwood Park, Alta., T8A 3X6	66°46'-67°15'N
	108°42'-109°17'W

REFERENCES

Fraser (1964); Fraser, Heywood and Mazurski (1978); Roscoe (1985); Schiller (1965); Thorpe (1966, 1972); Seaton (1984, 1988).

DIAND assessment reports: 017144, 017151, 017163, 017166, 081345, 082095.

PROPERTY

BACK 1; BEAVER 2,4; BOOTH; CRACROFT 2; FARN; GAP; HARE; HOOD 1-10; KNUT; OTTER; OWL; OWL 2-5; PISTOL 2,3; TURN; TURNER; WOLF 5-9.

LOCATION

The claims and survey areas are from 535 km to 590 km northeasterly of Yellowknife, and extend across the James, Hood and Booth Rivers (Fig. 8-15).

HISTORY

Noel Avadluk discovered gold south of Wilberforce Falls in 1964 and staked 36 NOEL claims to cover the showings. Later the showings were staked as the FARN and KNUT claims. The history of exploration to 1985 is summarised in Schiller (1965), Thorpe (1966, 1972), Seaton (1984) and Seaton *et al.* (1987).

The FARN and KNUT claims were recorded in October 1979; BOOTH, HARE, HOOD 1, OWL and TURNER in March 1984; HOOD 2, OTTER and WOLF 5-9 in September 1984; BACK 1 in December 1984; BEAVER 2-4, CRACROFT 2, GAP 1, 2, HOOD 3-7 and PISTOL 2, 3 in September 1985; and HOOD 8-10 and OWL 2-5 in October 1986.

DESCRIPTION

The only published map of the area is in Fraser (1964) and is a 1:506 880 geological reconnaissance map of a much larger area.

The Wilberforce Basin is crudely H-shaped with the bar of the H oriented northwesterly. A zone of metasediments with units of iron formation, argillite and curiously conglomerate (indicating rapid change from low energy to high energy depositional environments), describes an arc convex to the west and up to 2 km wide extending northerly through the central part of the basin, which is mainly filled with greywacke metaturbidites. A second much shorter zone of iron formation trends northerly through the FARN-KNUT property. Structure of the basin is not well known. On the FARN-KNUT claim block, where mapping and drilling have detailed the stratigraphy, a stratigraphically lower silicate iron formation is separated from overlying oxide iron formation by some 245 m of quartz-biotite schist which includes a 2-m-wide unit of graphitic argillite. This sequence has been isoclinally folded. Fold axes and axial planes of the folds plunge and are inclined southwesterly. Beds are overturned on the eastern limbs of the folds (personal communications: C. Staargard and Silver Hart Mines Ltd.'s Annual Report, 1986). At 67°05'N, 109°11'W on BEAVER 4 claim in the central part of the Wilberforce Basin iron formation dips steeply northwesterly and is stratigraphically overlain a few metres to the northwest by conglomerate in which granitoid clasts are enclosed in a black argillite matrix.

The Wilberforce Basin is flanked to its west by granitoid and locally gneissic and migmatitic granitoid rocks. A granitoid pluton projects southwesterly into the basin west of Wilberforce Falls. To the east and southeast the Archean rocks of the Wilberforce Basin are overlain by, or in faulted contact with, Proterozoic sediments of the Goulburn Group, though a mafic to ultramafic sill-like complex is intruded along the unconformity along much of its length (Roscoe, 1985). This intrusion has been staked in part for its copper, nickel and platinum group metal potential (BOOTH, HARE and OWL claims).

The zones of iron formation in the Wilberforce Basin may be continuous beneath Proterozoic cover with auriferous iron formations in the George Lake area of the Beechey Lake Basin, but this is highly speculative.

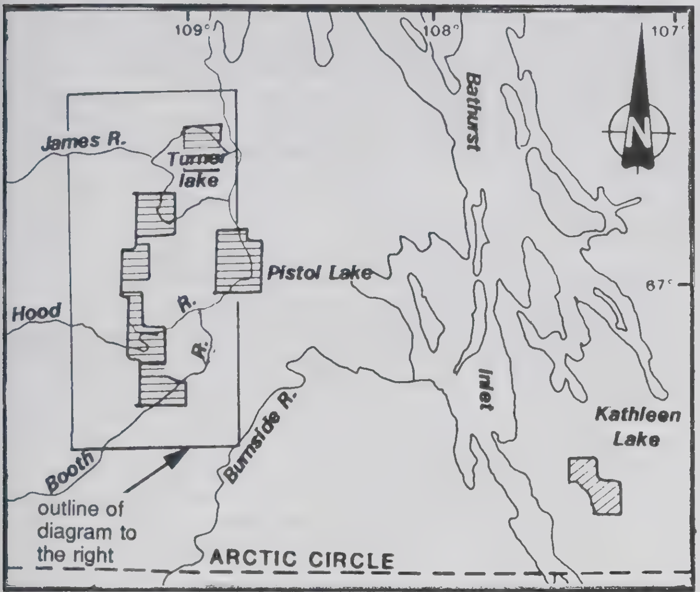


FIGURE 8-15: HOOD and other claims, and airborne geophysical coverage, Bathurst Inlet area.

Metamorphic grade in the Wilberforce Basin is mostly lower amphibolite (Fraser, Heywood and Mazurski, 1978), but increases to upper amphibolite towards the southwestern margin of the basin toward the contact with flanking migmatitic and gneissic rocks. Though gold in iron formation has been the main target of exploration in the Wilberforce Basin for several years, discovery of gold with arsenopyrite and pyrrhotite in a quartz stockwork in a zone described as an albitite dyke on the TURNER claim (Silver Hart Mines Ltd.'s Annual Report, 1986) and the presence of weakly auriferous tuffs may indicate other targets have been overlooked.

CURRENT WORK AND RESULTS

From May to July 1986 an electromagnetic/resistivity/magnetic/VLF EM (DIGHEM III) survey, was flown over three areas in the Wilberforce Basin (Fig. 8-15). Most of the areas flown had already been staked, with the exception of the OWL and HARE claims. The three areas flown and the claims which cover them are shown in Figure 8-15.

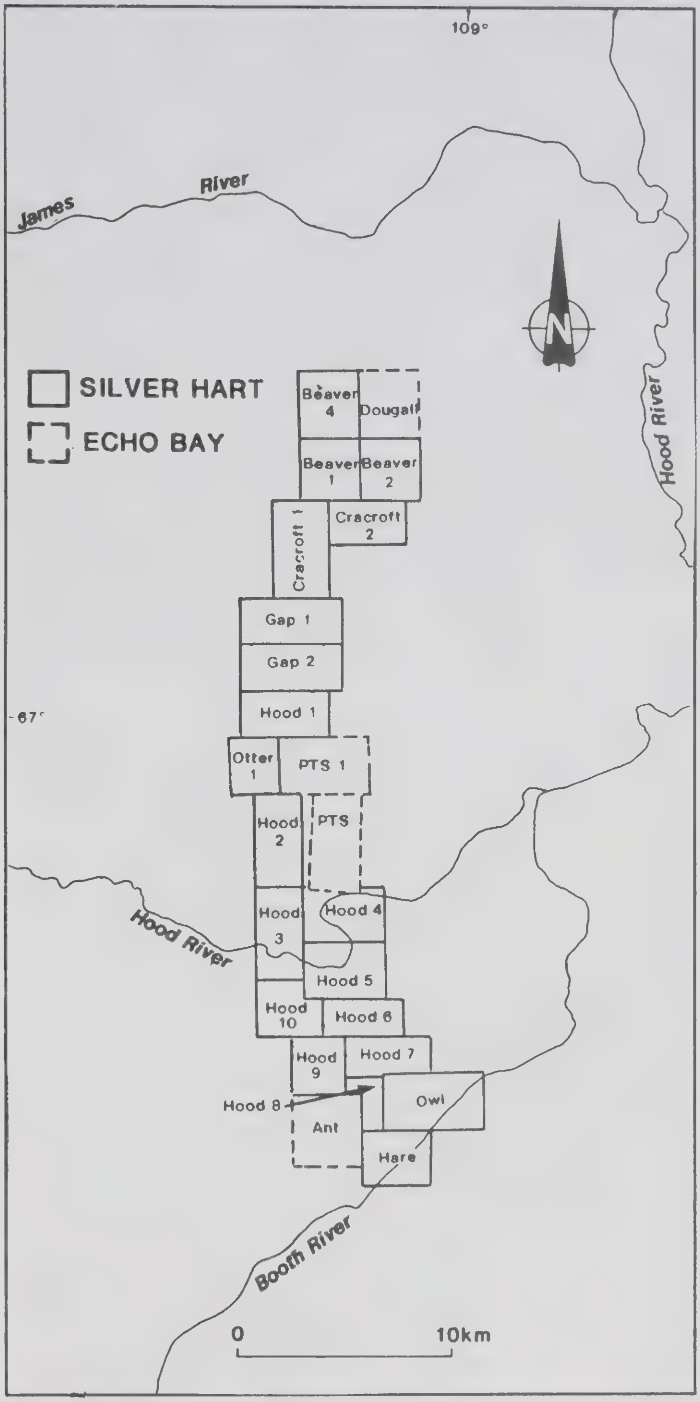
Numerous linear conductors were delineated in belts of metasediments containing iron formation and in the Turner Lake (TURNER, TURN claims) areas. Many of these conductors have coincident or flanking magnetic anomalies, suggestive of magnetite- or pyrrhotite-bearing iron formation. Many magnetic highs, generally conformable to the strike of the metasediments, but locally cross cutting, are probably caused by gabbroic sills or dykes such as the large one to the west of the gold-bearing zones on the FARN and KNUT claims. Such magnetic sills are distinct from the Helikian Mackenzie dykes which form prominent northwesterly trending magnetic features.

PTS CLAIMS

Echo Bay Mines Ltd.	Gold
Exploration Office	76 K/14
354 Granville Sq.	66°57'N, 109°10'W
200 Granville St.	
Vancouver, B.C., V6C 1S4	

REFERENCES

Fraser (1964).
DIAND assessment reports: 017150, 082084.



PROPERTY

PTS, PTS 2.

LOCATION

The property is 555 km northeasterly of Yellowknife. The southeast corner of the PTS claim is on the north bank of the Hood River (Fig. 8-16).

HISTORY

NTS area 76 K/14 was explored in 1965 by Roberts Mining Company Ltd. as Prospecting Permit 41.

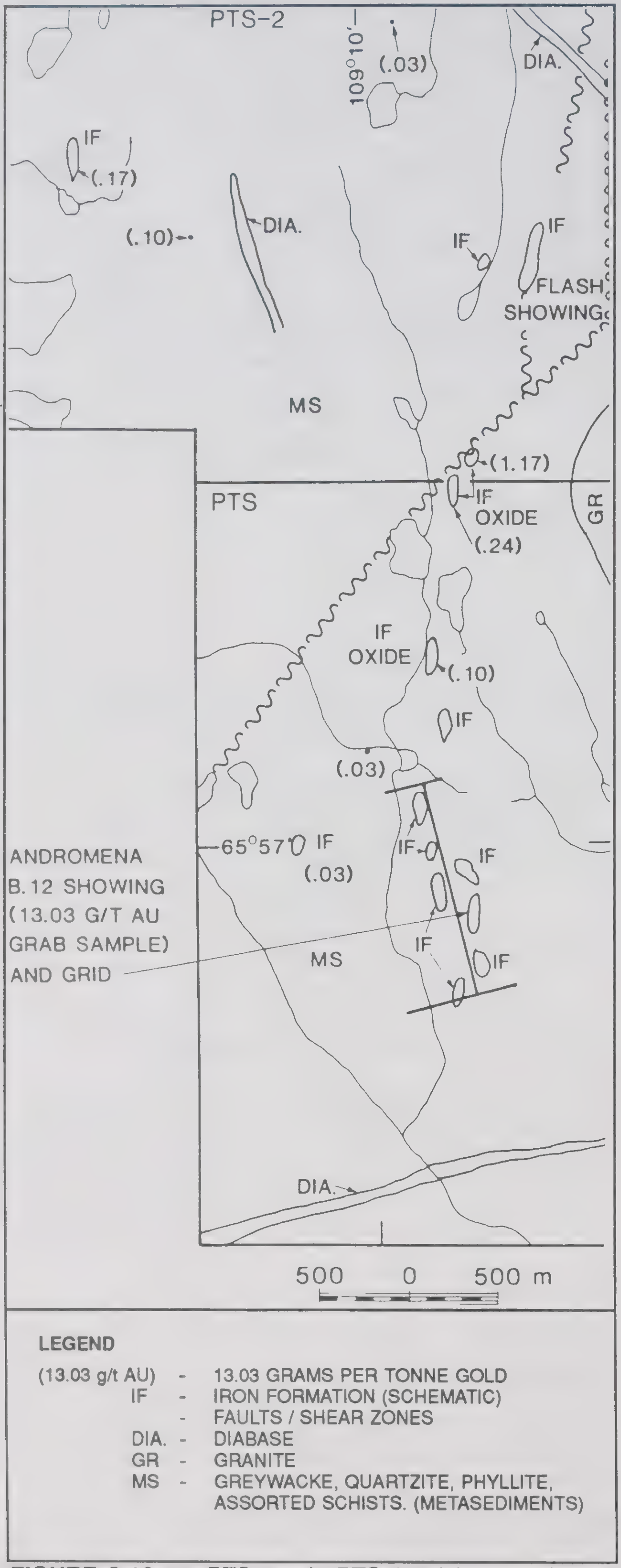


FIGURE 8-16: PTS and PTS 2 claims and grid. Geology from DIAND assessment report 082084.

The PTS claim was recorded in October, 1984 and covers the Andromena or B-12 gold showing discovered in August, 1984, in the course of a helicopter traverse during reconnaissance of the Booth River area. PTS 2 was recorded in September, 1985 to cover northern extensions of the auriferous iron formation outcropping on and north of the Andromena grid.

DESCRIPTION

The area was first mapped in 1962 at 1:506 880 in the course of a regional helicopter reconnaissance (Fraser, 1964). In 1964 Roberts Mining Company Ltd. geologically mapped Prospecting Permit 41 (76 K/14) at 1:60 000 (DIAND assessment report 017150). Claims PTS and PTS 2 are underlain almost entirely by greenschist facies metasediments, which have a general northerly strike and locally include iron formation lenses which form a zone in sheared and poorly exposed metasediments, which can be traced northwards from the central part of PTS to the eastern part of the PTS 2 claim. The zone appears to be displaced dextrally by a northeast-trending fault at the northern boundary of the PTS claim. Iron formation also outcrops at one locality in the northwest part of PTS 2. The iron formation is locally auriferous.

CURRENT WORK AND RESULTS

In 1985 work was confined to the Andromena (B-12) grid (Fig. 8-16). A geological sketch map was prepared and a VLF EM test was performed on the two most northerly lines of the grid, where a conductor coincides with northerly to north-northeasterly trending locally arsenopyrite- and pyrite-rich iron formation.

One hundred and twenty-three samples were collected. Auriferous samples were scattered along the length of the grid and were found to be associated with sulphide-rich iron formation.

HOOD RIVER PROJECT

Silver Hart Mines Ltd.	Gold
209, 320 Sioux Rd.	76 K/14; 76 N/3
Sherwood Park, Alta., T8A 3X6	66°46'-67°08'30"N
	108°57'-109°17'00"W

REFERENCES

Fraser (1964); Roscoe (1985).

DIAND assessment reports: 017150, 019556, 019577, 060268, 082084, 082095, 082566, 082567, 082568, 082600.

PROPERTY

BEAVER 1, 2, 4, CRACROFT 1, 2, GAP 1, 2, HARE, HOOD 1-10, OWL.

LOCATION

The property extends 36 km in a northerly direction (Fig. 8-15). It is centred on latitude 67°N, 560 km northeasterly of Yellowknife and 30 km west of Portage Bay, Bathurst Inlet.

HISTORY

The area was geologically mapped at 1:506 880 in a 1962 (Fraser, 1964) helicopter reconnaissance.

The first documented mineral exploration was by Roberts Mining Company Ltd. in 1964 (DIAND assessment report 017150), which held and explored Prospecting Permits 41

(76 K/14), 42 (76 N/2, Pistol and Turner Lakes) and 43 (76 N/6), and prospected adjacent areas. In the southeastern corner of NTS sheet 76 K/14 Roberts Mining Company reported evidence of drilling done a few years earlier. This could have been done by Canadian Nickel Company who were exploring in the northern Bear and northern Slave Provinces in the late 1950's and early 1960's.

Hope Bay Syndicate held claims in the area during the 1960's but little work was done (DIAND assessment reports: 019556, 019577, 060268).

Silver Hart Mines recorded the OWL, HARE and HOOD 1 claims in March 1984, the BEAVER 1, CRACROFT 1, OTTER 1 and HOOD 2 in September 1984. Silver Hart's BEAVER 2, 4, CRACROFT 2, GAP 1, 2 and HOOD 3-7 were recorded in September and HOOD 7-10 in October 1985. Echo Bay Mines Ltd. claims which adjoin Silver Hart's property are the DOUGALL, PTS, PTS 1 and ANT, recorded between October 1984 (PTS) and October 1985. Work on the PTS claims for 1984 and 1985 is documented in DIAND assessment report 082084, and on the DOUGALL claims from 1984 to 1987 in DIAND assessment reports 082566, 082567 and 082568.

DESCRIPTION

Silver Hart's Hood River Property (Fig. 8-15) extends 36 km in a north-northwesterly to north-northeasterly arc, convex to the west across the Wilberforce Basin, a structural basin filled largely with Archean turbiditic metasediments of the Yellowknife Supergroup. The claims cover an arcuate trend of iron formations, which include oxide and silicate facies. Sulphidic zones are found in both the silicate and oxide facies. The sulphidic zones are more commonly auriferous in the silicate than the oxide iron formation.

The Wilberforce Basin is bounded to the west by Archean granitoid rocks which intrude the Yellowknife Supergroup rocks and migmatitic rocks of which the Yellowknife Supergroup metasediments locally form part. The basin is bordered to the northeast and southeast by Aphebian sediments of the Goulburn Group which locally unconformably overlie or are in faulted contact with the Archean rocks, but more commonly are separated from the Archean rocks by a sill-like body of gabbroic rock, or the erosional remnant of a mafic-ultramafic complex of late Archean or early Proterozoic age.

Oxide iron formation and Proterozoic diabase dykes of the northwesterly trending Mackenzie Swarm form strong magnetic features in the Wilberforce Basin. Mafic magnetic sills which locally are close to iron formation locally complicate interpretation of magnetics. Easterly trending Proterozoic diabase dykes predate the Mackenzie swarm and are most numerous in the northern part of the property.

CURRENT WORK AND RESULTS

In 1986 Silver Hart Mines flew DIGHEM III surveys over four survey blocks in the Bathurst Inlet area: the Hood River Project area, Turner Lake area, Pistol Lake area, all in the Wilberforce Basin or at its margins (Fig. 8-15) and the Kathleen Lake area on the east side of Bathurst Inlet. Frequency domain EM and VLF EM resistivity, EM magnetic (derived from frequency domain EM), total field magnetics and enhanced magnetics results were plotted on 1:10 000 photomosaics.

Of these techniques, enhanced magnetics (in which magnetic data are manipulated to enhance local as opposed to regional features), proved the most effective in delineating both oxide and silicate iron formation. VLF EM was also found generally useful in delineating stratigraphic trends, and of particular use in delineating a unit of locally sulphidic silicate iron formation west of the oxide iron formation.

Subsequent to the DIGHEM III survey the claims were geologically mapped at 1:10 000 and samples taken throughout the claims. Most rock samples were grab samples of iron formation and were analysed for gold, as were a few chip samples. Samples of selected rocks (Booth River granophyre, HOOD and BEAVER 1 claims crystal tuff, mafic volcanics from BEAVER 4, and diorite, pyroxene gabbro and amphibolite from ground adjoining the Hood Property) were sent for whole rock analysis. Thirteen samples of iron formation taken during initial reconnaissance were analysed for 24 elements by I.C.P. technique. Nineteen rock samples were collected for thin sectioning and petrographic examination.

Geological mapping used in conjunction with geophysical data traced units of iron formation along a 33 km-long belt (Fig. 8-15). Most of this iron formation is oxide (magnetite) iron formation and "consists of bands of massive or disseminated magnetite rhythmically interbedded with yellowish green grunerite and recrystallised chert on a scale of millimetres to decimetres." (DIAND assessment report 082600). The silicate iron formation "... is generally thinner and more discontinuous than the oxide iron formation. These horizons (silicate iron formations) are chiefly composed of millimetre to centimetre scale banded silicious amphibolite .... Almandine garnets are locally so numerous as to produce discrete bands. Lenses and layers of fine recrystallized chert are common." These descriptions of iron formation would apply throughout the northern Slave Province in those localities where metamorphic grade has been adequately high to produce garnets.

Sulphides in oxide iron formation locally constitute as much as 10% by volume and include pyrite and/or pyrrhotite, rarely arsenopyrite, mainly as fine disseminations and veinlets.

In the silicate iron formation sulphides may locally exceed 20% by volume. In one case disseminated pyrrhotite alone is reported to reach 20% with 1% arsenopyrite and 29.35 ppm Au (fire assay).

Of nine samples from the Hood River Property with geochemical analyses of more than 1000 ppb Au, four were from silicate iron formation or silicic amphibolite and three were from oxide iron formation. The samples from silicate iron formation contained between 1280 and 28 000 ppb Au, those from oxide iron formation ranged from 1200 ppb to 2280 ppb. A rock from the CRACROFT claim described in a petrographic report as felsic crystal tuff, with a whole rock analysis of 49.71% SiO_2 12.02% Al_2O_3, 10.59% Fe_2O_3, 10.60 MgO, 7.04% Fe, 2.91% Na_2O and 0.82% K_2O was found locally to contain gold. Outside the property, boundary felsic tuffaceous rock has been found to contain locally as much as 25 000 ppb Au. None of the gold anomalies reported had any significant width or strike extent. Commonly, grab samples from iron formation contained 5 to 10 ppb Au.

WOLF CLAIM

Silver Hart Mines Ltd.	Gold
209, 320 Sioux Rd.	76 K/15; 76 N/2
Sherwood Park, Alta., T8A 3X6	67°03'N, 108°47'W

REFERENCES

Fraser (1964); Schiller (1965); Thorpe (1966, 1972); Seaton (1984); Seaton *et al.* (1987).

DIAND assessment reports: 017144, 017151, 017163, 017166, 081345, 082607.

PROPERTY

WOLF 6.

LOCATION

The property is 575 km northeasterly of Yellowknife and less than 1 km west of the Hood River. Wilberforce Falls is 2.5 km north of the property.

HISTORY

The claim adjoins and lies east of the KNUT claim which together with the adjacent FARN claim (Fig. 8-17) has been the focus of many years of gold exploration (Schiller, 1965; Thorpe, 1966, 1972; Seaton, 1984; Seaton *et al.*, 1987; and DIAND assessment reports cited). The WOLF 6 claim was recorded for Silver Hart Mines in October, 1986.

DESCRIPTION

The property is underlain mainly by turbiditic metasediments of the Yellowknife Supergroup of amphibolite metamorphic grade.

CURRENT WORK AND RESULTS

A grid was constructed over the southwestern part of WOLF 6 and the eastern part of the KNUT claim (Fig. 8-17).

The grid was explored by magnetometer survey. Strong northwesterly and northerly trending positive magnetic features join in the southern part of the grid and suggest folded iron formation.

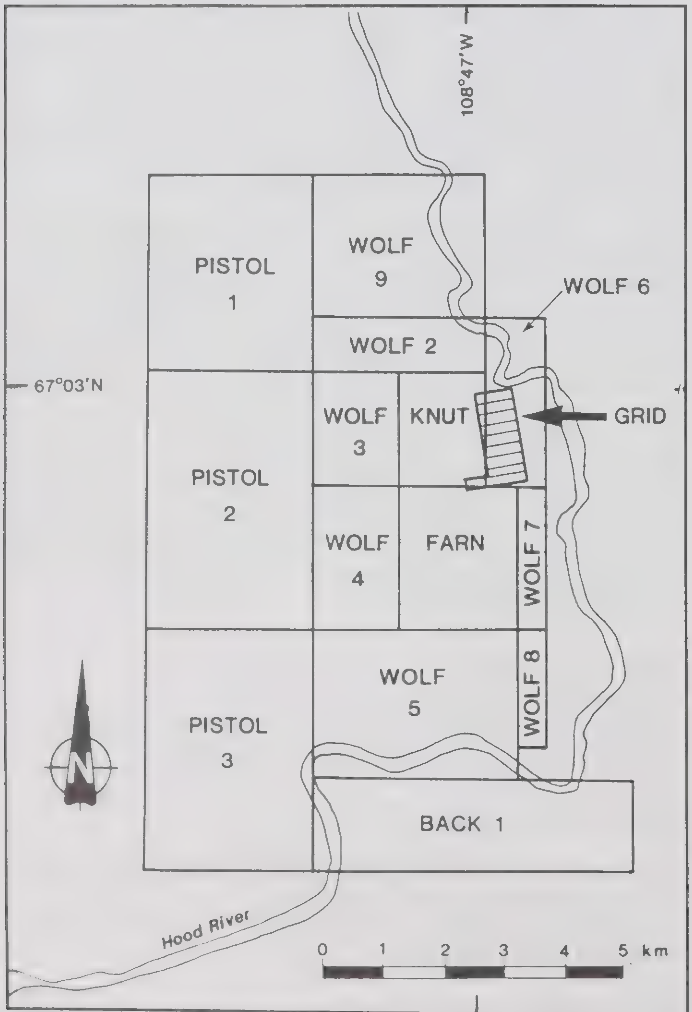


FIGURE 8-17: WOLF, FARN, KNUT, PISTOL and BACK claims and WOLF 6 grid.

TURNER LAKE PROJECT

Silver Hart Mines Ltd.
209, 320 Sioux Rd.
Sherwood Park, Alta., T8A 3X6

Gold, Nickel, Copper, Cobalt
76 N/2,3,6,7
67°13'N, 108°56'W

REFERENCES

Fraser (1964); Schiller (1965); Thorpe (1966).
DIAND assessment reports: 017143, 017145, 017149, 017152, 017166, 082608.

PROPERTY

TURNER 1, TURN 1-5.

LOCATION

The claims are 590 km northeasterly of Yellowknife and 3 km east of the confluence of the Hood and James rivers. Turner Lake, which drains northward into the James River, occupies part of the TURNER 1 and TURN 1 claims (Fig. 8-18).

HISTORY

The Main Gold Showing at Turner Lake on TURNER 1 claim was discovered by Noel Avadluk and George Turner who were prospecting for Roberts Mining Company Ltd. in 1963-1964. In 1964 Roberts Mining Company staked contiguous CCI 1-36 and COM 1-36 claim groups to secure the gold showing and nearby nickel-copper(-cobalt) showings respectively, and acquired Prospecting Permits 41 (76 K/14), 42 (76 N/2) and 43 (76 N/6).

During 1964 and 1965 Roberts Mining Company geologically mapped Prospecting Permit 42 at 1:60 000, and the CCI and COM claims at 1:12 000. Other work included magnetometer surveys of the Main Gold Showing and Main Nickel Showing (Nickel Knob), and EM traverses across the latter. The Main Gold Showing was explored by several trenches that were mapped at 1:300. Samples from the largest trench averaged 8.5 g/t Au but two diamond drill holes, totalling 165 m, drilled under this trench intersected much lower concentrations (2.4 g/t Au across 3.05 m).

The history of exploration at Turner Lake and adjoining areas is summarised in Schiller (1965) and Thorpe (1966) and recorded in the several assessment reports cited.

After 1965 little work was done at Turner Lake apart from some additional trenching and sampling by the Hope Bay Syndicate in 1967, the results of which are not available.

Silver Hart Mines Ltd. recorded TURNER 1 in March 1984 and TURN 1-5 in November 1985 following preliminary sampling in 1984.

DESCRIPTION

The Turner Lake Property (Fig. 8-18) is at the northern end of the Wilberforce Basin. The northeastern part of the property is underlain by granitoid rocks which are intrusive into turbiditic metasediments of the Yellowknife Supergroup that underlie much of the southern and central part of the claim group.

A shear zone extends south-southwesterly from the centre of the property on TURNER 1 to beyond its southern margin. West of this shear zone lies a belt of metasediments 1 to 1.5 km wide alternating with sill-like intrusions of diorite, amphibolite and granodiorite. The belt is flanked to the west by a unit of polymictic conglomerate which is roughly 250 m thick, and has been traced for more than 6 km across the Turner

Lake Property from 1.5 km south of the James River to the southern boundary of the TURNER-TURN claim block. East of the shear zone, the rocks are similar to those to its west, but are folded and lack the north-northeasterly trend of the belt seen to the west of the shear zone.

Several diabase dykes of the Mackenzie Swarm trend northwesterly across the Turner Lake Property and a broad segmented gabbroic body, locally as much as 1 km wide, trends north-northwesterly through the claim block from the southeast corner through the central part of its northern boundary.

The Main Gold Showing is about 750 m west of Turner Lake. A small stock of olivine gabbro flanked by turbiditic metasediments lies 2.5 km south-southwest of the Main Gold Showing. The Main Nickel Showing (Nickel Knob Showing) is at the southwestern contact of the olivine gabbro plug.

CURRENT WORK AND RESULTS

In 1986 the Main Gold Showing was geologically mapped at 1:1000, sampled and explored by magnetometer and VLF EM surveys. A DIGHEM III survey was flown over the property (see Wilberforce Basin Airborne Survey). After the Main Gold Showing was mapped, some 50% of the property was geologically mapped at 1:10 000, prospected and sampled. Most of the mapping was in the southern and central part of the claim block, on TURNER 1 and TURN 2, but less complete coverage extended into other parts of the property. Magnetometer and VLF EM surveys were conducted at the Nickel Knob (Ni-Cu-Co) Showing.

At the Main Gold Showing (67°12'45"N, 108°55'45"W), native gold was found with arsenopyrite and pyrrhotite in a quartz stockwork. The stockworks are reported to be developed in "albitite" dykes cutting amphibolitised pyroxene gabbro where these rocks have been folded on a scale of about 500 m. There are at least three gold-bearing zones within a strike length of 500 m (DIAND assessment report 082608). Field examination of the trenched showing by the writer did not suggest to him that the host rock was an albitite; rather it appeared to be silicified amphibolite. If the encouraging gold assays are related to concentration of gold in steeply plunging fold noses, then there is a reasonable chance of gold-bearing zones extending to depth.

A magnetometer survey showed the Main Gold Showing to be associated by a weak and discontinuous positive magnetic anomaly. A VLF EM survey did not provide useful results.

The Nickel Knob (Ni-Cu-Co) Showing and associated olivine gabbro plug are coincident with well-defined magnetic anomalies. The VLF EM survey at Nickel Knob gave ambiguous results.

During prospecting and sampling of the Turner Lake property a gold showing was found immediately east of Turner Lake at 67°11'45"N, 108°54'30"W. It is a 1-2 m wide quartz-veined pelitic zone containing up to 28 ppm Au in grab samples. Gold is associated with quartz, arsenopyrite and pyrrhotite.

Numerous showings of copper, nickel, cobalt and arsenic were found in the diorite intrusions near their contacts with other rocks, particularly with granodiorite and pyroxene gabbro. Grab samples from trenches 1.4 to 2.4 km north of the Main Gold Showing, that were excavated by Roberts Mining Company on their COM claims (now TURNER 1) contain up to 0.6% Cu, 1.04% Ni, 0.118% Co and 500 ppb Au. Gold content is anomalous in several other nickel-copper-cobalt showings. Sulphides in these showings are disseminated in the diorite and include pyrrhotite, minor pentlandite, chalcopyrite, arsenopyrite, niccolite, gersdorffite, safflorite, pyrite, galena.

Five samples were collected for petrographic examination and whole rock analysis. These included granodiorite, diorite, "mineralised zone-proximal", "mineralised zone-distal" and conglomerate.

In 1987 the Main Gold Showing was explored by diamond drilling. Seventeen holes totalling 1601 m were drilled.

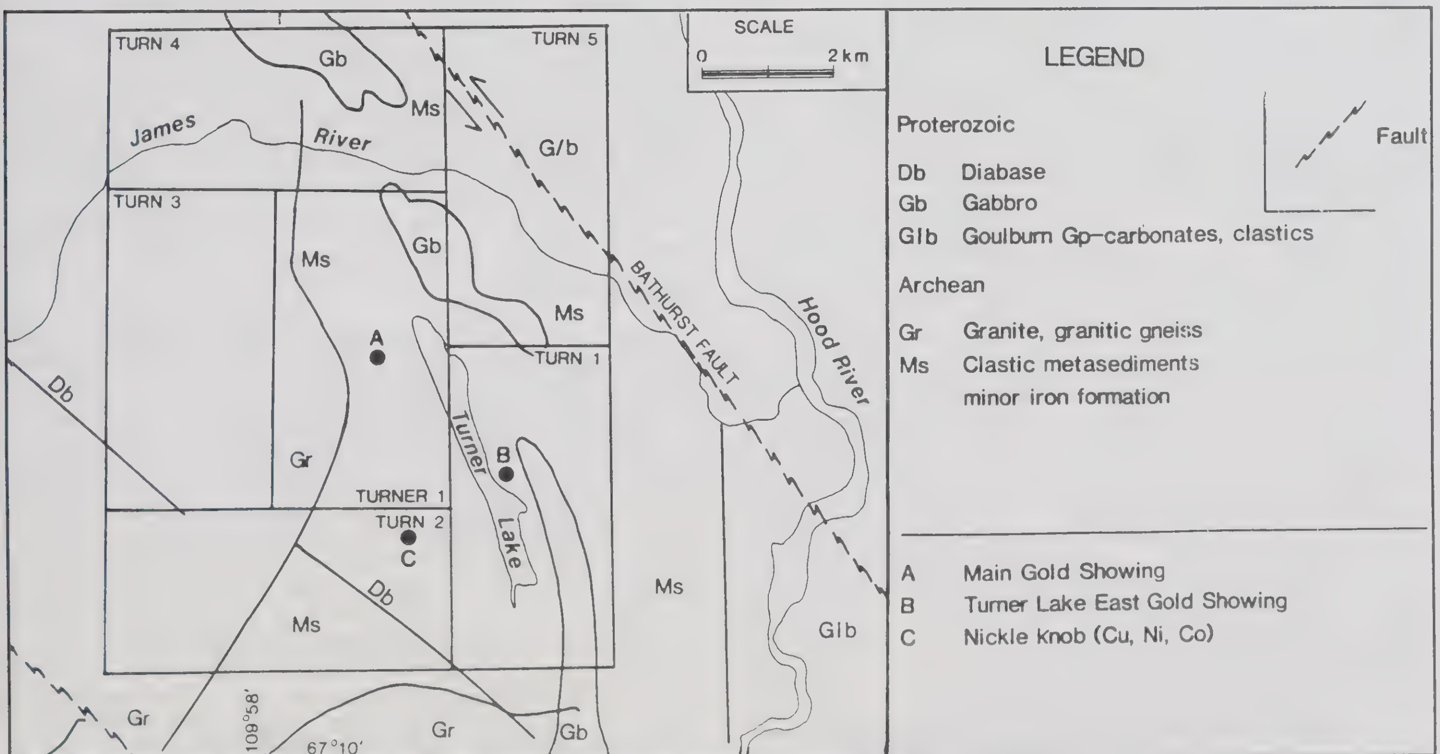
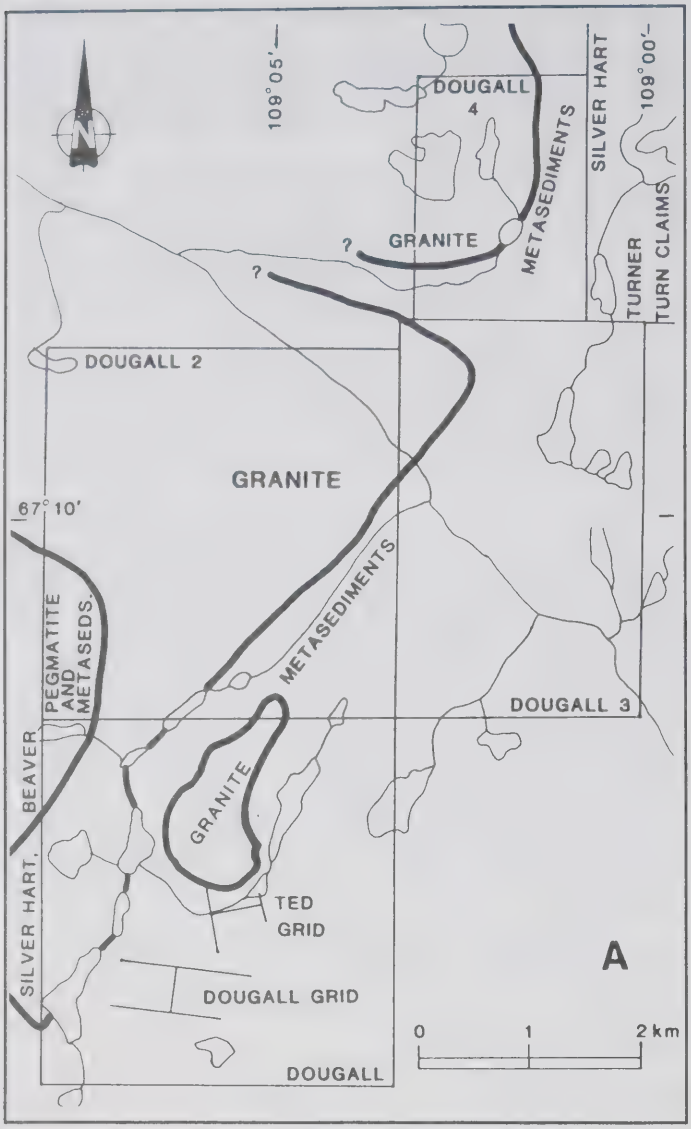


FIGURE 8-18: *TURNER and TURN claims. Geology from assessment report 082608.*



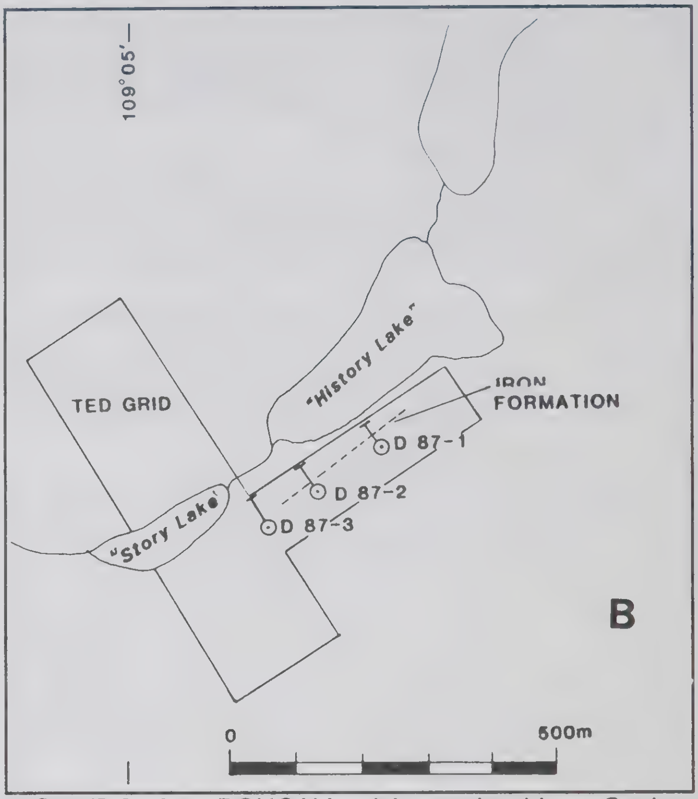


FIGURE 8-19: *DOUGALL claim and grids. Geology simplified from DIAND assessment reports 082566, 082567, 082568.*

DOUGALL CLAIMS

Echo Bay Mines Ltd.	Gold
354 Granville Sq.	76 N/3
200 Granville St.	67°09'N, 109°03'W
Vancouver, B.C., V6C 1S4	

REFERENCES

Fraser (1964).
DIAND assessment reports: 082566, 082567, 082568.

PROPERTY

DOUGALL, DOUGALL 2-4.

LOCATION

The claims are 585 km northeasterly of Yellowknife and about 13 km southwest of the confluence of the Hood River and James River.

HISTORY

The area was prospected for gold in the 1960's by Roberts Mining Company Ltd. DOUGALL (or DOUGALL 1) was recorded for Echo Bay Mines August 1985, DOUGALL 2 and 3 in September 1985 and DOUGALL 4 in October 1985.

During a 1984 regional reconnaissance, Echo Bay Mines discovered iron formation on the DOUGALL claims. The iron formation is mainly silicate and sulphide poor with a few sulphide-rich lenses which were locally auriferous, as was pyrrhotite-rich silicious greywacke at the Ted A Zone.

During 1984 and 1985, DOUGALL 1-4 claims were explored by prospecting, rock and soil sampling grid surveying, geological mapping, magnetometer and VLF EM surveys. All of this work was confined to two grids: the Ted Grid and Dougall Grid on DOUGALL 1 (Fig. 8-19). Soil sampling was done only on the Dougall Grid and VLF EM only on the Ted Grid. On each grid there are two gold showings (DIAND assessment report 082568).

DESCRIPTION

The only published geological map is by Fraser (1964). Fraser and others mapped the area at 1:506 880 as part of a 1962 helicopter supported reconnaissance.

The DOUGALL claims are largely underlain by the Yellowknife Supergroup metasediments which fill the Wilberforce Basin. In the northeastern part of the property much of DOUGALL 2 and about half of DOUGALL 4 is underlain by granitoid rock. A small granitic stock occupies the north-central part of DOUGALL 1. Units of iron formation outcrop mainly on DOUGALL 1 near the granitic stock and in an area to its southwest where it is spatially associated with polymictic conglomerate and numerous pegmatitic bodies.

A unit of conglomerate 100 to 300 m thick has been mapped by Echo Bay Mines geologists. The conglomerate trends northwesterly through the northern part of DOUGALL 3 and into the southern part of DOUGALL 4 where it is truncated at a granite contact. A unit of amphibolite and chlorite schist

averaging about 150 m thick has been traced from the southeastern corner of DOUGALL 1 to the northeastern corner of DOUGALL 3 where it passes onto Silver Hart Mines' TURNER 2 claim.

Metamorphic grade on the claims ranges from upper greenschist to lower amphibolite.

CURRENT WORK AND RESULTS

In 1986 the Ted Grid area was explored by a magnetometer survey, prospecting and trenching. High gold assays from the Ted A Zone in the north-central part of the grid confirmed results of earlier sampling. A 200 m long northeasterly trending magnetic high coincides with the Ted A Zone of auriferous pyrrhotite-rich silicious greywacke and closely associated iron formation. A narrow northwesterly trending magnetic high was delineated along the Ted B Zone in the southern part of the grid.

In 1987 the Ted Grid was extended across the ice of two small lakes (Fig. 8-19) and a magnetometer survey conducted over the grid extension, and later in areas west and south of the Ted Grid. Additional prospecting was done on the DOUGALL 1-3 claims. On DOUGALL 2 and 3 claims conspicuous gossans were found and sampled.

Three holes totalling 155 m were drilled at the Ted A showing (Fig. 8-19).

Magnetometer surveying did not find extensions of the anomaly associated with the Ted A Zone. Samples from the gossan zones did not have encouraging gold contents, though samples from trenches excavated by Roberts Mining Company 1.3 km north of the Ted A Zone were strongly auriferous; a composite grab sample from one trench assayed 14.87 g/t Au.

The three diamond drill holes intersected mainly coarse conglomerate, lesser amounts of metagreywacke and thin zones of sulphide-poor iron formation, which in one hole was auriferous.

BEECHEY LAKE BASIN

The term "Beechey Lake Basin" is used in this report to denote the large area underlain by metasedimentary rocks centred at Beechey Lake. Metamorphic grade increases northwesterly and southeasterly towards the Thelon Front, away from the northwestern end of Beechey Lake. The Beechey Lake Basin adjoins the Hackett River volcanic belt (Frith, 1981a,b).

MR 1 CLAIM, PROSPECTING PERMITS 1042, 1043

Back River Joint Venture	
Trigg, Woollett, Olson Consulting Ltd.	Gold
	76 G/3 NW,SE
10504 - 103 St.	65°00'-65°15'N
Edmonton, Alta., T5H 2V4	107°00'-107°30'W

REFERENCES

Frith (1981a,b); Gibbins *et al.* (1977); Seaton (1978).

DIAND assessment reports: 061343, 061344, 061392, 081973, 082134.

PROPERTY

MR 1 Claim; Prospecting Permits 1042, 1043.

LOCATION

The permits are 460 km northeasterly of Yellowknife. Permit 1043 is 1 km west of Casey Lake.

HISTORY

In 1974 and 1975, Du Pont of Canada Exploration Ltd. explored NTS quadrants 76 G/2 and 76 G/3 as Prospecting Permits 328 and 329, respectively (DIAND assessment reports: 061343, 061344, 061392; Gibbins *et al.*, 1977; Seaton, 1978). Du Pont's main target was base metal volcanogenic massive sulphides, but in the course of exploration a gold showing (currently staked as Cominco's BEE 1-3 claims; 15 km north-northeast of MR 1) was found. In 1983, Trigg, Woollett, Olson Consulting, as operators for Back River Joint Venture, performed prospecting and rock sampling on 76 G/3 NW and SE. The MR 1 claim was recorded in September 1984 and Prospecting Permits 1042, 1043 were granted on February 1, 1985. In 1984 the Prospecting Permits 1042 and 1043 areas were explored by reconnaissance prospecting and rock sampling and 1:10 000 geological mapping along strike from gold showings found in 1983, and the MR 1 claim was staked to cover auriferous zones in iron formation discovered in 1983 and 1984. Iron formation was discovered in 1984 in the northeastern quarter of Permit 1042 and in the north-central part of Permit 1043 in the "Needle Lake" area east and southeast of MR 1 claim. A gold showing was found in sulphide-bearing quartz veins within sulphidic zones in magnetite-chert iron formation at "Needle Lake" (Fig. 8-20). Sulphides recorded include pyrrhotite, pyrite and arsenopyrite; the latter closely associated with black cross-cutting quartz veins. Fine-grained conformable grey quartz veins were also reported. In 1985 exploration was confined to Prospecting Permit 1043 and comprised prospecting, rock sampling and 1:10 000 geological mapping.

DESCRIPTION

The regional geology of the area has been mapped and compiled by Frith (1981a,b). Figure 8-20 shows Prospecting Permits 1042 and 1043 and geology from Frith (1981a). Much of the permit area is underlain by Beechey Lake Group metasediments, after which granitoids are the most abundant rock type. A small part of Prospecting Permit 1042 is underlain by volcanics of the Hackett River Group and a yet smaller part by a narrow belt of Back Group volcanics. Cominco's Prospecting Permits 1053, 1054 and 1055 adjoin Prospecting Permit 1042 to the northeast, north and east respectively.

CURRENT WORK AND RESULTS

In 1986 work was concentrated at several gold showings in the northwestern quarter of Prospecting Permit 1043. The gold showings are in an arcuate belt peripheral to a tonalite pluton (Frith 1981a) and trending easterly through the MR 1 claim and southeasterly through "Scissor Lake" and "Needle Lake," which are some 300 m and 1100 m, respectively, from the northeastern end of the ovoid pluton (Fig. 8-20). Mapping by the Back River Joint Venture showed the dominant rock type in the belt to be grey to black fine-grained greywacke interbedded with and grading into mudstone. Several thinner units of iron formation which are locally sulphidic, mainly oxide-silicate and silicate, were mapped. Oxide iron formation contains mainly magnetite and chert; silicate iron formation contains varying proportions of chlorite, amphibole, chert and garnet. Work at three locales included one or more of the following methods: prospecting, overburden stripping, rock sampling, grid surveying, geological mapping at 1:5000, 1:2000 or 1:50, magnetometer and VLF EM surveying.

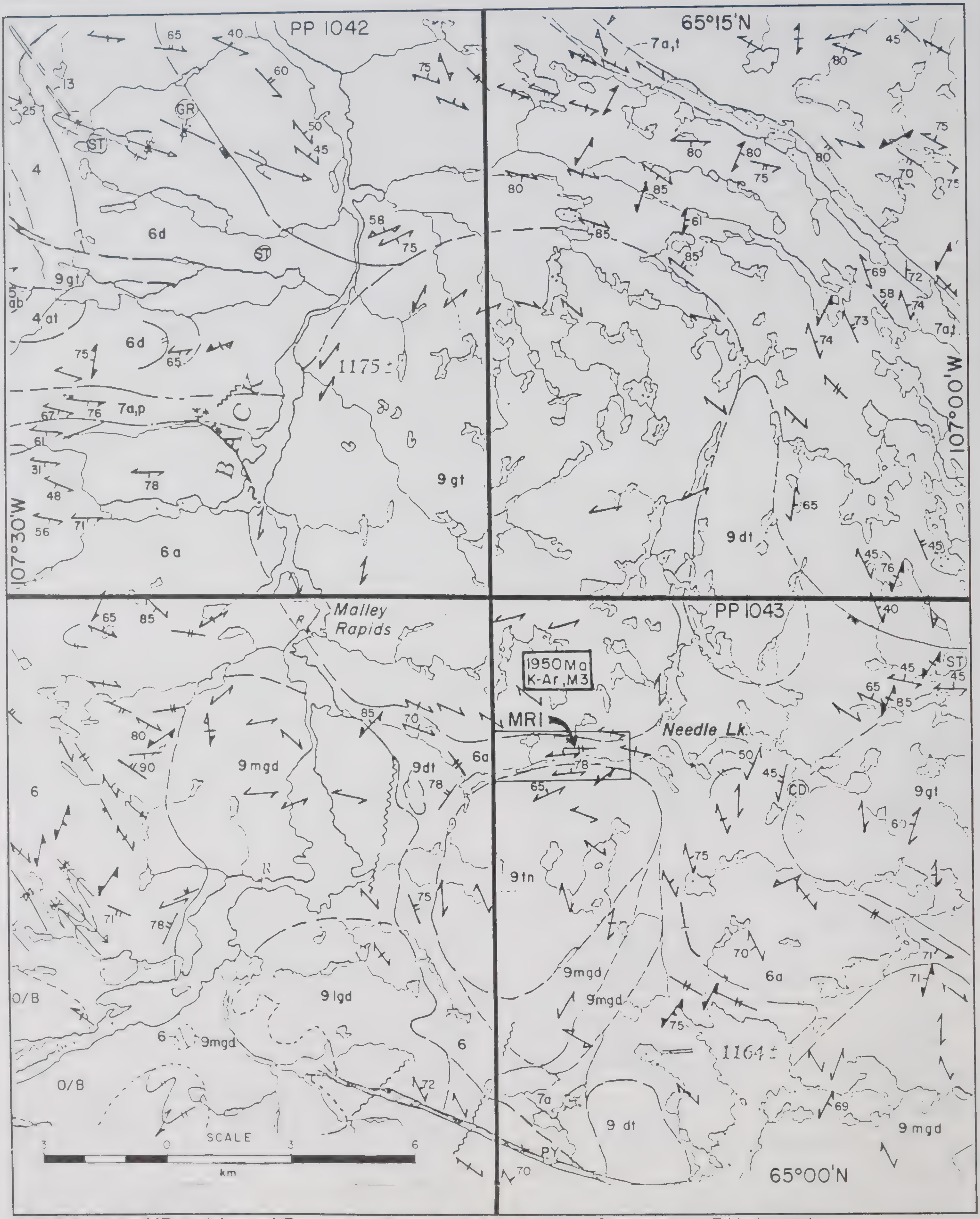


FIGURE 8-20: MR 1 claim and Prospecting Permits 1042 and 1043. Geology from Frith (1981a).

LEGEND FOR FIGURE 8-20

QUARTERNARY

O/B	Sand and gravel

ARCHEAN

REGAN INTRUSIVE SUITE

9gt	Granite
9lgd	Leucogranodiorite
9dt	Diorite, quartz diorite

YELLOWKNIFE SUPERGROUP

BACK GROUP

7	7a, massive and pillowed andesite, porphyritic andesite and andesitic tuff.

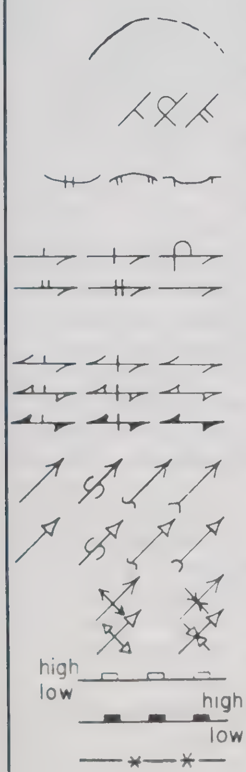
BEECHEY LAKE GROUP

6	6, undifferentiated greywacke, mudstone, carbonaceous shale; 6a, greywacke; 6b, mudstone; 6c, carbonaceous mudstone; 6d, porphyroblastic gneiss and schist derived from 6a-6c; 6e, locally migmatitic rocks derived from 6a-6c.

HACKETT RIVER GROUP

4	IGNERIT FORMATION: felsic and basic flows, fragmental volcanics, volcanic sediments, iron formation, chert, sulphide-rich zones; 4a, dacite, dacitic tuff; 4b, andesite, basalt, tuff; 4c, carbonate with dacitic fragmental rocks.

SYMBOLS



Geological boundary (defined, approximate, assumed)

Bedding (tops known, overturned, tops unknown)

Bedding trends (dip unknown, tops unknown, tops known)

Bedding-cleavage:
S_1 (top known: inclined, vertical, overturned)
(top unknown: inclined, vertical, dip unknown)

Axial planar foliation:
S_1 (dip inclined, vertical, unknown)
S_2
S_3

Lineation:
L_1 (mineral, minor fold axis, warp axis, clast elongation)
L_2

Antiform, synform with plunge:
F_1
F_2

Biotite isograd

Staurolite-cordierite isograd

Sulphide-rich strata

t Tuffaceous rock

p Pillowed

ST Staurolite

DIVING ELEPHANT PROJECT

Bow Valley Industries Ltd.	Gold
2020, 1177 W. Hastings St.	76 G/6,7,8,11,12
Vancouver, B.C., V6E 2K3	65°15'-65°37'30"N
	106°12'-107°33'W

REFERENCES

Frith (1981a,b).
DIAND assessment report: 082070.

PROPERTY

BEEP 1-8; BOW 2-4; DEL 1-5; JB 2.

LOCATION

"Del Lake" sometimes known as "Diving Elephant Lake" is 505 km northeasterly of Yellowknife, and 8 km northeast of Beechey Lake.

HISTORY

BOW 2-4 and JB 2 were recorded in September, 1985 and are mainly southwest of Del Lake where a camp was established in 1985. BOW 2 is staked over a northwesterly trending auriferous zone. The remaining claims were recorded in December, 1985.

DESCRIPTION

The claims and adjoining areas that were geologically reconnoitred and prospected are shown in Figure 8-21. The area staked and geologically reconnoitred is largely underlain by Archean metasediments of the Beechey Lake Group. Metamorphic grade is on the low grade side of the cordierite-andalusite isograd except in the extreme southeast. Metamorphic grade also increases westward towards the Hackett River volcanic belt where several granitoid plutons are exposed. Frith (1981a,b) has mapped and compiled the regional geology at 1:125 000.

CURRENT WORK AND RESULTS

In 1985 Bow Valley Industries was operator of the project which comprised 1:31 680 geological mapping and prospecting of the property area and three adjoining areas, staking, and 1:2 000 geological mapping and geophysical surveys of the adjacent grids, H1 and H2, on BOW 2 and BOW 3 claims, respectively.

Areas reconnoitred and prospected but not staked in 1985 lie southeast of the BEEP, BOW, DEL, JB claim block on the southwest side of Beechey Lake and in the southwestern quadrant of NTS 76 G/11 and a small adjoining part of 76 G/12.

The H1 and H2 grids cover stratabound auriferous silicified zones with concordant and crosscutting quartz veins. The silicified zones contain 1%-4% euhedral arsenopyrite and locally, on the H1 grid, visible gold. Two grab samples from the H1 grid assayed slightly over 34 g/t Au and one sample assayed 67.4 g/t Au. The auriferous zones are unusual for the Beechey Lake area because the host rock is argillite, commonly crenulated, or greywacke with abundant intercalated argillite, as opposed to iron formation which hosts gold at several localities on the Back River Joint Venture property directly to the north. Bedding and cleavage which are parallel or subparallel to bedding dip steeply to the southwest on the H1 and H2 grids.

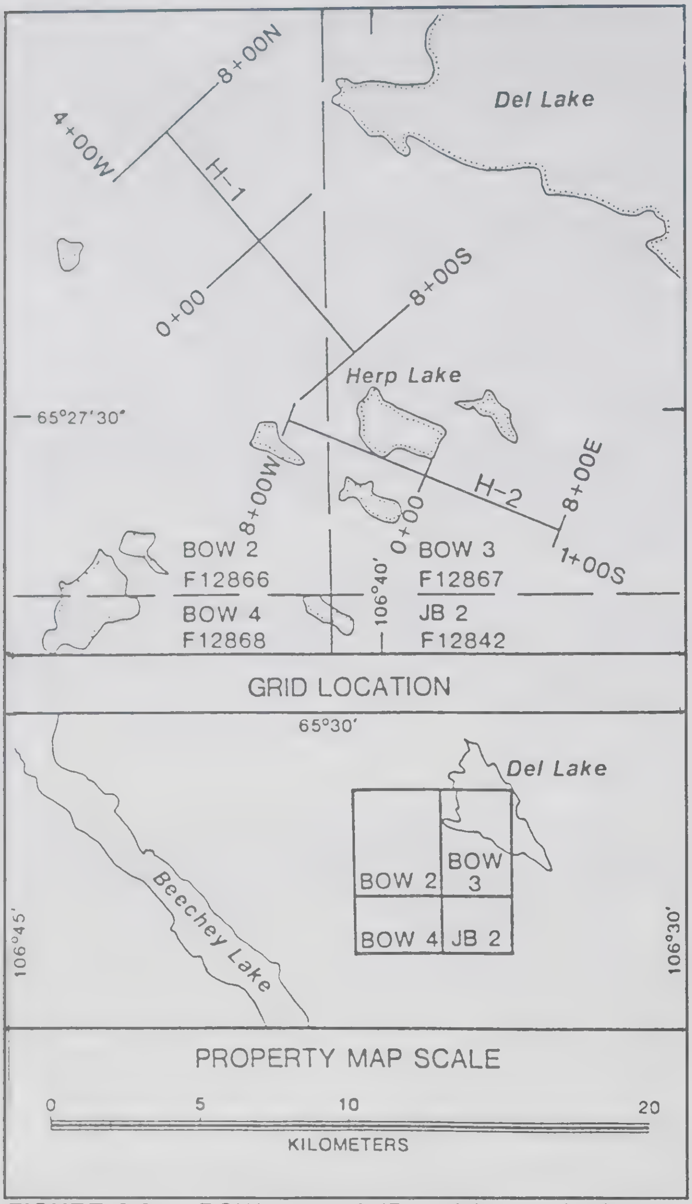


FIGURE 8-21: *BOW 2-4 and JB 2 claims and grids.*

The grid area is on the low grade side of the biotite isograd (Frith 1981b).

VLF EM conductors and locally coincident magnetic anomalies were outlined on both grids and may be caused by graphitic argillite, swamp, and concentrations of pyrrhotite and other sulphides.

In 1986 Bow Valley Industries' joint venture partner, Welcome North Mines Ltd., was operator. Work comprised geological mapping, prospecting and extensive trenching and chip sampling. Eleven diamond drill holes tested the most promising showings, but results were disappointing and the project was discontinued. Nine of the drill holes tested the Beechey zone near the extension of the H3 grid baseline (Fig. 8-21), the remaining two tested the Phoenix zone at the southeastern end of the H1 grid.

A zone of actinolite skarn and of sulphide-bearing skarn containing more than 2% arsenopyrite flanks much of the margin of a small granitic stock on BEEP 2. The zone was mapped and sampled. At the southern end of the stock within the sulphide-bearing skarn, a 30 m-long zone of massive sulphides (>30% chalcopyrite, pyrite, pyrrhotite, arsenopyrite and nicolite) yielded grab samples containing 7.25 g/t and 2.24 g/t Au.

BEECHEY LAKE NORTH PROJECT

Back River Joint Venture	Gold
c/o Trigg, Woollett, Olson	76 G/9-11,13-16;
Consulting Ltd.	76 J/4
10504 - 103 St.	65°30'-66°07'30"N
Edmonton, Alta., T5H 2V4	106°15'-107°45'W

REFERENCES

Frith (1981a,b,c); Seaton (1984); Seaton and Crux (1985); Seaton, Brophy and Crux (1987).

DIAND assessment reports: 081705, 081813, 081822, 081975, 082114, 082115, 082116, 082117, 082628, 082629, 082630, 082631, 082637.

PROPERTY

Prospecting Permits: 973, 1014-1017, 1032-1041, BRAU 1-56, 70, LAB 1, SO 1.

LOCATION

At the start of 1986 the Beechey Lake North Project (Fig. 8-22) comprised a single block of prospecting permits and claims that lay from 500 to 560 km northeasterly of Yellowknife and extended 105 km in a northwesterly direction. The southwestern corner of this property is at Beechey Lake. Expiry of Prospecting Permits 1014 - 1017 in February 1987 split the property into a northwest block (George Lake area) and a southeastern block that included: the Boulder Pond area, the Goose Lake area, the Boot Lake area and the Ellice River area.

HISTORY

Trigg, Woollett, Olson Consulting Ltd. has acted as manager of the Back River Joint Venture since its inception in 1982.

During the seventies several companies explored the Proterozoic rocks of the Bathurst Inlet area and the Proterozoic-Archean unconformity for uranium. In 1979 areas later held by Trigg, Woollett, Olson Consulting Ltd. as Prospecting Permits 973, 1016 and 1035 were held and explored for uranium by Urangesellschaft Canada Ltd. as Prospecting Permits 740, 739 and 742 respectively (Seaton, 1984).

Trigg, Woollett, Olson Consulting Ltd. acquired Prospecting Permit 973 on February 1, 1983, following 1982 reconnaissance. Permits 1014-1017 were acquired in February 1984 and Permits 1032-1041 in February 1985. LAB 1 and SO 1 were recorded in September 1984.

Prospecting Permit 973 expired in February 1986 and Prospecting Permits 1014-1017 in February 1987.

BRAU 1-9 (covering part of the George Lake area previously held as Prospecting Permit 973) were recorded in October 1985. BRAU 10-15 (that adjoin BRAU 1-9 to the south) were recorded in October 1986, prior to expiry of Prospecting Permit 1017. The remaining claims of the George Lake area (BRAU 39, 40, 70) were not recorded until October 1987, and were staked in anticipation of expiry of Prospecting Permit 1033 in February 1988.

In the Boulder Pond area, BRAU 16-23 were recorded in October 1986 in anticipation of the expiry of Prospecting Permit 1015, and BRAU 41-43 (on ground immediately to the south and bordering the SO 1 claim) were recorded in October 1987, prior to expiry of Prospecting Permit 1041.

In the Goose Lake area BRAU 50-56 were recorded in October 1987; the eastern half of the block on Prospecting Permit 1039 and the western half on Prospecting Permit 1040.

The Boot Lake area and Ellice River area are included in a single claim block. Until February 1987 the Boot Lake area and part of the Ellice River area were covered by Prospecting Permit 1014; BRAU 24-38 were recorded in October 1986 to secure this area. BRAU 44-49 were added to the claim block in October 1987 to secure ground on Prospecting Permits 1036 and 1037 which were due to expire the following year.

Locations of areas, prospecting permits and claim blocks are shown in Figure 8-22.

In 1985 four locales in the George Lake area and targets at Oar Lake and Rooster Lake were explored by a total of 2518 m of drilling in 35 holes. In the George Lake area a large trench was excavated at "Fold Nose", northeast of the lake and several other targets were explored.

The history of exploration of this project, one of the largest in the area and expenditure in the Slave Province, is reviewed very briefly in Seaton and Crux (1985) and Seaton, Brophy and Crux (1987).

DESCRIPTION

Roughly 75% of the area covered by the Beechey Lake North Project is underlain by Archean metasediments of the Beechey Lake Group, comprising greywacke, mudstone, carbonaceous mudstone, iron formation or their metamorphic derivative gneisses and schists (Fig. 8-22). Roughly two-thirds of the Archean metasediments are on the low grade side of the biotite isograd. Only about 10% of the permit area is underlain by metasediments on the high grade side of the staurolite-cordierite isograd (Frith, 1981a,b). The largest area of such rocks surrounds three biotite-muscovite granite stocks (Frith, 1981c), mainly on Prospecting Permits 1037 and 1040. In the southeast corner of the project area, on Permit 1039, the regional metamorphic gradient increases southeasterly towards the Thelon Front. An increase in metamorphic grade is also apparent at the northwestern margin of Prospecting Permit 1033, north of Index Lake, where several granodiorite plutons are exposed within an area of higher grade metasediments (Fig. 8-22).

The Archean metasediments within the project area are isoclinally folded and have a dominant northwesterly structural grain, as indicated by bedding and S_1 cleavages. An anomalous west-northwesterly strike of bedding exists in the southern part of Prospecting Permit 1014.

Ten of the fifteen prospecting permits of the Beechey Lake North Project are underlain, to varying extents, by Goulburn Group Proterozoic sediments of the Western River Formation. Prospecting Permit 1032 is underlain almost entirely by Proterozoic rocks.

CURRENT WORK AND RESULTS

George Lake area 76 G/13 NE, 76 G/14 NW, SW

1986: Prospecting Permits 973 (expired February 1986), 1017, 1033. BRAU 1-9, 10-15, 39, 40, 70; LAB 1. See DIAND assessment report 082117.

Of the six areas, the George Lake area was the most intensively explored in 1986. Work was concentrated at several gold-bearing zones and one geophysical target, and comprised one or more of reconnaissance prospecting, geological mapping at 1:10 000, 1:2000 and 1:1000 scales, ground magnetometer, VLF EM, horizontal loop EM (HLEM) and SP surveys, grid surveying, rock chip and rock grab sampling, and diamond drilling. A total of 2917 m was drilled in 31 holes at seven gold showings and one geophysical target.

1987: In 1987 drilling was confined to the George Lake area, where a total of 3,682 m was drilled in 20 holes at six localities. Only a small amount of exploration other than drilling was done.

Boulder Pond area 76 G/10 NW, SW

1986: Prospecting Permits 1015, 1041. BRAU 16-23, 41-43, SO 1. See DIAND assessment report 082115.

The Boulder Pond area extends roughly 15 km in a north-northwesterly direction. Boulder Pond is a 300 m long pond towards the northern end of this area. The Boulder Pond area is roughly 15 km southwesterly of the George Lake area.

Several gold showings, discovered in 1983 and 1984, and three targets that were delineated by the 1985 DIGHEM(R) airborne survey were explored. At each showing or geophysical target, work consisted of one or more of: prospecting, rock sampling, grid surveying, 1:5000 or 1:2000 scale geological mapping, ground magnetometer, and VLF EM and HLEM surveys.

Results of this work were considered sufficiently encouraging to warrant further exploration, including diamond drilling.

1987: Work comprised grid surveying, prospecting, rock sampling and geophysical surveys.

Ellice River area 76 G/9 NW, 76 G/16 SW

1986: Prospecting Permits 1014, 1036. BRAU 24-29, 45-47. See DIAND assessment report 082114.

This area is directly southwest of the Western River, which here flows northwesterly along the Bathurst Fault. The Ellice River, which flows easterly is about 5 km southeast of the Ellice River area at its nearest point.

Work in 1986 was done at several gold showings discovered in 1985 and three target areas delineated as a result of the 1985 DIGHEM(R) survey. One or more of the following was done at each work location: reconnaissance prospecting, rock chip and rock grab sampling, grid surveying, geological mapping, and ground magnetometer and VLF EM surveying.

Results were thought sufficiently encouraging to justify further exploration, including drilling, but work was not resumed in 1987.

Boot Lake area 76 G/9 NW

1986: Prospecting Permit 1014. BRAU 30, 31. See DIAND assessment report 082114.

In 1986 work was done at gold showings discovered in 1984 and at two target areas outlined by a 1985 DIGHEM(R) survey. One or more of the following were performed at each work area: prospecting, rock chip and rock grab sampling, grid surveying, and 1:5000 scale geological mapping.

Results were adequately encouraging to justify further work including drilling.

1987: Most 1987 exploration other than diamond drilling was at the Boot Lake area. Work comprised: prospecting, 1:2000 geological mapping, rock sampling, magnetometer VLF EM and HLEM surveys, and a small amount of trenching.

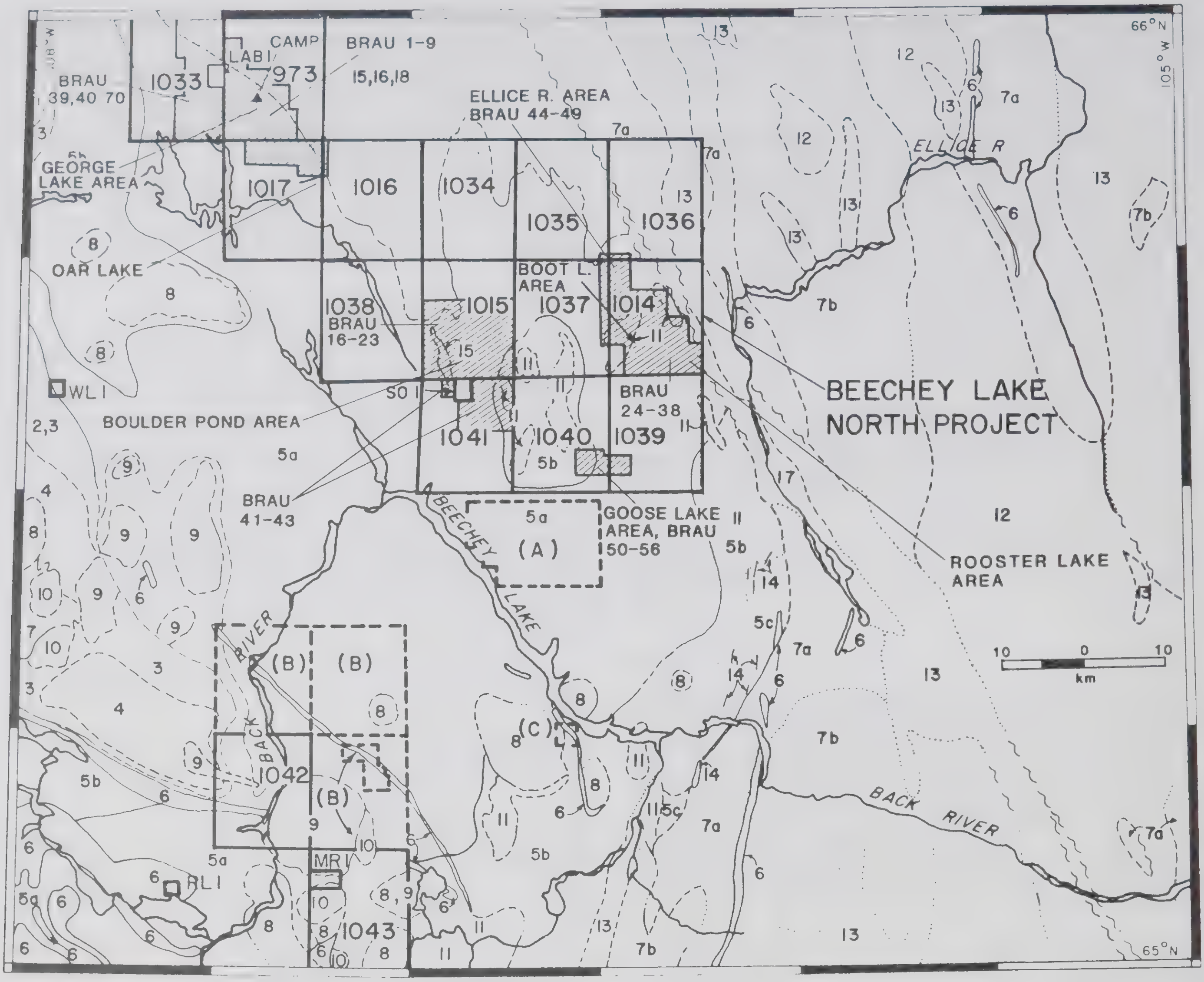


FIGURE 8-22: Back River Joint Venture property in Beechey Lake area. Geology from Frith (1981a,b).

Rooster Lake area 76 G/9 NW

1986: Prospecting Permit 1014. BRAU 31, 35-37. See DIAND assessment report 082114.

The area extends 5 km southeasterly from roughly 1 km south of "Boot Lake" to 1 km west of Rooster Lake. Three target areas, outlined by the 1985 DIGHEM(R) survey, were explored. At each, one or more of the following methods were employed: reconnaissance prospecting, rock chip and rock grab sampling, grid surveying and geological mapping.

Results were considered sufficiently encouraging to justify further exploration including drilling.

1987: In 1987 work comprised grid surveying, prospecting, rock sampling, geophysical surveys and a small amount of overburden stripping.

Goose Lake area 76 G/9 SW

1986: Prospecting Permits 1039, 1040. BRAU 50-56. See DIAND assessment report 082116.

Exploration in 1986 focused on gold showings discovered in 1984 and 1985 and on six targets delineated by the 1985 DIGHEM(R) airborne survey. At each, one or more of the following were conducted: reconnaissance prospecting, rock chip and rock grab sampling, grid surveying, geological mapping, magnetometer, VLF EM and HLEM surveys. A geochemical lodgement till sampling orientation survey was carried out in the "Goose Lake South" and "Goose Neck" areas.

Results were considered to warrant more exploration including drilling.

1987: In 1987 work comprised grid surveying, prospecting, rock sampling and geophysical surveys.

Legend for Figure 8-22

PROTEROZOIC	18	Gabbro
	17	Ellice River Fm: conglomerate, arkose, shale, sandstone, carbonate
	16	Burnside River Fm: pink quartzite, conglomerate, sandstone, shale, slate
	15	Western River Fm: greywacke, argillite, sandstone, carbonate, conglomerate
AGE UNCERTAIN	14	Pegmatite
	13	Gneiss and migmatite of uncertain origin, includes amphibolite, dioritic, and mylonitic granitized rocks
ARCHEAN	12	Augen K-feldspar gneiss, predominantly granodioritic
	11	Biotite muscovite granite
	8–10	REGAN INTRUSIVE SUITE
	10	tonalite, diorite, quartz diorite
	9	granite
	8	granodiorite
	7	Migmatitic gneiss and migmatite (probably derived from Yellowknife Supergroup)
	7a	biotite gneisses with 10-50% leucosomes
	7b	migmatite with more than 50% leucosomes
	6	Back Group: andesite, basalt and dacite flows, breccia and tuff
	5	BEECHEY LAKE GROUP
	5a	greywacke, mudstone, carbonaceous mudstone
	5b	prophyroblastic gneiss and schist derived from 5a
	5c	biotite gneiss with no porphyroblasts
	1–4	HACKETT RIVER GROUP
	4	dacite, metamorphosed, deformed
	3	felsic and basic flows, fragmental volcanics, volcanic sediments, iron formation
	2	andesite, basalt and dacite flows and fragmentals
	1	biotite-chlorite schist, sericitic schist, mafic amphibole gneiss and quartzofeldspathic gneiss derived from volcanogenic sediments

INDEX LAKE RECONNAISSANCE

Bow Valley Industries Ltd.
2020, 1177 W. Hastings St.
Vancouver, B.C., V6E 2K3

Gold
76 G/13
65°45'-65°55'N,
107°32'-107°58'W

REFERENCES

Frith (1981a); Seaton *et al.* (1987).
DIAND assessment report: 082070.

LOCATION

The centre of the area is 465 km northeasterly of Yellowknife on the western arm of Index Lake.

HISTORY

The area has no documented history of mineral exploration, though it is probable that airborne geophysical surveys have been flown by one or more mining companies. Adjoining areas (76 G/13 NE and 76 G/14 NW and SW) have been explored by the Back River Joint Venture as the Beechey Lake North Project since 1982 (Seaton *et al.*, 1987).

DESCRIPTION

The regional geology has been mapped at 1:31 680 by Indian and Northern Affairs and by the Geological survey of Canada. This work was compiled by Frith (1981a) into his 1:125 000 map of the Nose Lake area.

The area is underlain by Archean metasediments of the Beechey Lake Group which are intruded by two small granodiorite plutons west of Index Lake. The biotite isograd crosses Index Lake in a northwesterly to northerly direction. Metamorphic grade increases westwards with the staurolite-cordierite isograd (Frith, 1981a) passing through the western extremity of Index Lake.

CURRENT WORK AND RESULTS

In 1985 the area was explored by 1:31 680 mapping and prospecting. One outcrop of amphibolitic silicate iron formation was noted near the south shore of a small lake about 6 km northwesterly of Index Lake.

Only four samples were taken: one from pyrite- and pyrrhotite-bearing iron formation, one from a graphitic shear zone and two from rusty metasediments, all of which assayed at or below the 0.03 g/t Au detection limit of the method used.

HACKETT RIVER RECONNAISSANCE

Bow Valley Industries Ltd.
2020, 1177 W. Hastings St.
Vancouver, B.C., V6E 2K3

Gold
76 K/1,2
66°06'-66°13'N
108°33'-108°50'W

REFERENCES

Bryan *et al.* (1976); Jefferson *et al.* (1976).
DIAND assessment report: 082070.

LOCATION

The area is centred 590 km northeasterly of Yellowknife and 10 km northwest of the confluence of the Mara River and Hackett River.

HISTORY

Though adjoining ground to the south (Bathurst Norsemines property) has been intensively explored for volcanogenic silver-base metal deposits during the 1970's, relatively little work was done in the Hackett River reconnaissance area.

DESCRIPTION

The area is mainly underlain by Archean metasediments of amphibolite facies; lesser areas are underlain by felsic and intermediate volcanics and granitoid rocks. Bryan and others (1976) mapped the southern two-thirds of 76 K/1 and Jefferson and others (1976) mapped 76 K/2. Both maps were published at 1:31 680 scale.

CURRENT WORK AND RESULTS

In 1985 three days of geological mapping and prospecting were completed. Two zones of silicate iron-formation were outlined with strike lengths of 1 km and more than 2 km. They contain up to 5% pyrite and pyrrhotite, but seven grab samples assayed less than 1 g/t Au. Grab samples of pyrite- and pyrrhotite-bearing sediments, of gossans capping volcanics, and of pyritiferous graphitic sediments, did not contain anomalous amounts of gold.

REGAN LAKE SUPRACRUSTAL BELT

In the Regan Lake area, Yellowknife Supergroup metasediments fill the gap between the Back River volcanic complex and the Hackett River volcanic belt. Locally the metasediments contain iron formation, which in places is auriferous.

REGAN LAKE RECONNAISSANCE

Bow Valley Industries Ltd.	Gold
2020, 1177 W. Hastings St.	76 G/3,7
Vancouver, B.C., V6E 2K3	65°00'-65°15'N, 107°20'-108°00'W

REFERENCES

Frith (1981a); Lambert (1981); Seaton (1984); Seaton and Crux (1985); Seaton *et al.* (1987).

DIAND assessment reports: 082624, 082070.

PROPERTY

Open ground.

LOCATION

The reconnaissance area is centred 445 km northeasterly of Yellowknife and 10 km northeasterly of Regan Lake.

HISTORY

Auriferous iron formation has been the target of gold exploration in the Regan Lake area since 1946. At the time of Bow Valley's 1985 reconnaissance, parts of the area were staked as the ALGOOD 1,2 claims, the SIDD claims and the PERU claims (Seaton, 1984; Seaton and Crux, 1985; Seaton *et al.*, 1987).

Details of earlier exploration may be obtained from references given in the reports cited above.

DESCRIPTION

The area is largely underlain by metasediments, intermediate and felsic volcanics (Frith, 1981a). Except in the extreme north of the area, north of Twin Lakes, rocks are of greenschist facies.

CURRENT WORK AND RESULTS

Two areas of open ground, one west of Regan Lake and the other extending southeasterly from Twin Lakes to the Back River were explored in 1985 by geological reconnaissance and prospecting. No claims were staked as a result of this work.

FIRE AND MG CLAIMS

Argus Resources Ltd.	Gold
200, 700 4th Ave. SW	76 G/4
Calgary, Alta., T2P 3J4	65°05'N, 107°43'W

REFERENCES

Frith (1981a); Lambert (1981).

DIAND assessment reports: 082624, 082625.

PROPERTY

FIRE 1-6; MG 1-3.

LOCATION

The claims form a single block adjoining and covering parts of Fidler Lake and Regan Lake. The property is centred roughly 435 km northeasterly of Yellowknife.

HISTORY

The claims were staked to cover showings discovered in the latter part of the "Thistle and Regan Lakes Reconnaissance". They were recorded in September 1986.

More complete references to exploration in the Regan Lake area are given under "Thistle and Regan Lake Reconnaissance."

DESCRIPTION

The property covers part of a "tongue" of intermediate and locally felsic volcanics that extends northeasterly from the main body of the Back River volcanic complex for roughly 22 km and then turns southwesterly through the property area to pass between Regan and Fiddler Lakes (Frith, 1981a; Lambert, 1981). Greenschist facies metasediments flank the volcanic tongue and underlie the northeastern and southwestern margins of the property and outcrop peripheral to Regan Lake which they presumably underlie.

The metavolcanics underlying the property include pillowed and massive andesite and andesitic tuffs, lesser amounts of dacite and rarely rhyolite. Synvolcanic intrusions of gabbro underlie a small part of the property, mainly near the northwestern shore of Regan Lake.

The Yellowknife Supergroup metasediments are largely greywackes and mudstones which are in places carbonaceous.

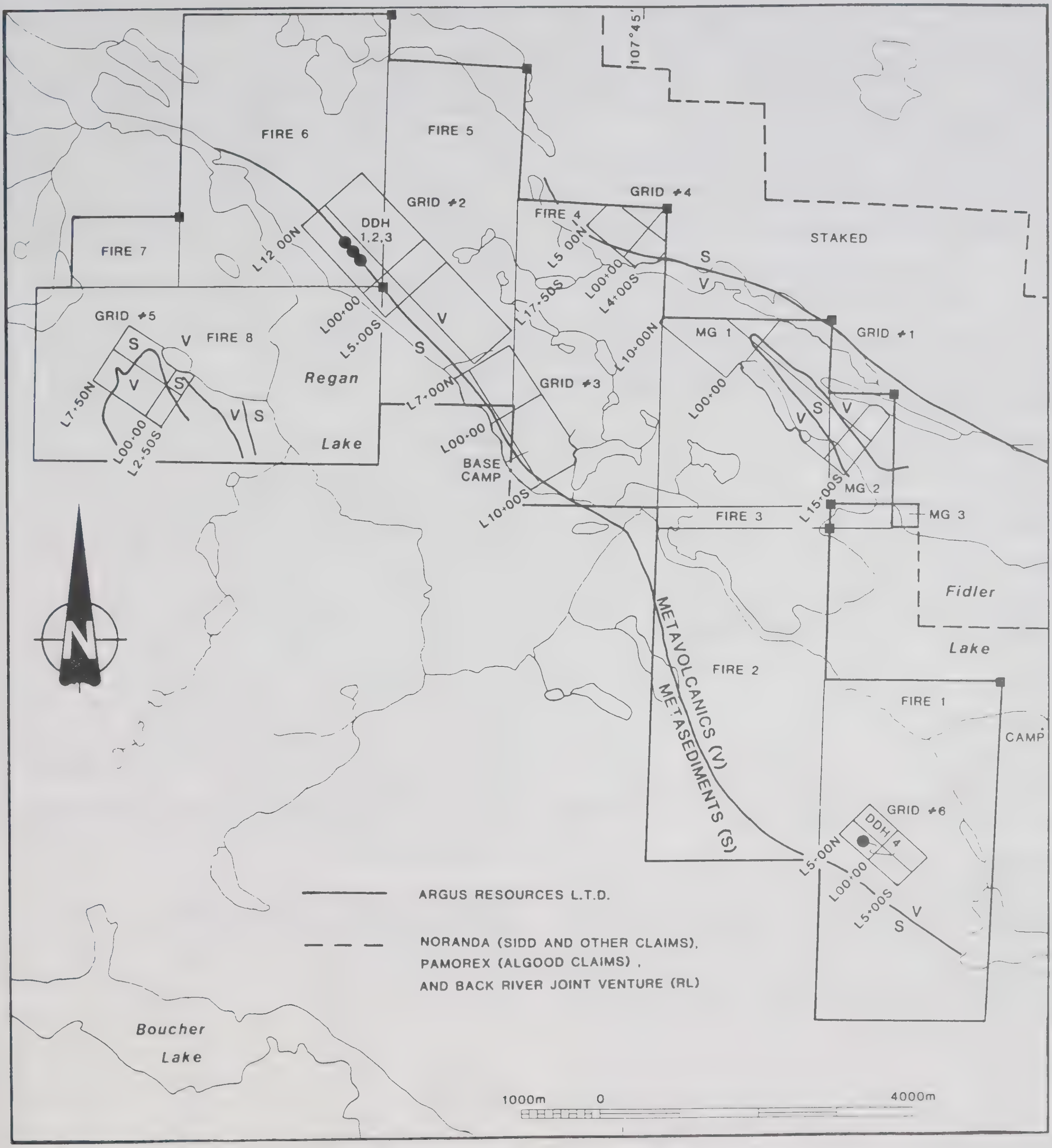


FIGURE 8-23: FIRE and MG claims and grids, Regan Lake area. Geology simplified from DIAND assessment reports 082624 and 082625.

CURRENT WORK AND RESULTS

In 1987 six grids were constructed on the FIRE and MG claim block (Fig. 8-23). The grids cover areas with anomalous gold concentrations discovered during 1986 regional reconnaissance. Five of the grids are at the contact between metavolcanics and metasediments. The sixth (Grid 6 on FIRE 1) is underlain largely by metavolcanics.

All six grids were explored by geological mapping, magnetometer and VLF EM surveys. Soil sampling was done on Grids 1, 2 and 4. The grids were mapped at 1:2500 scale and a small part of Grid 1 was also mapped at 1:1000.

Geophysical surveys outlined well defined conductors on Grids 1, 2, 3 and 6 that are locally coincident with magnetic anomalies as on Grid 3. These coincident anomalies are evidently caused by iron formation. Other VLF EM conductors appear to be related to faults as on Grid 1. Magnetic anomalies can be related to diabase dykes as well as oxide iron formation as on Grid 1 and Grid 4.

Four diamond drill holes totalling 191 m were completed. Three holes drilled on Grid 2 to test a VLF EM conductor and associated magnetic high intersected metasediments and metavolcanics. The hole drilled on Grid 6 intersected mainly metavolcanics. Core samples returned low assays for gold.

CONTWOYTO RIVER METASEDIMENTARY BELT

This metasedimentary belt encompasses Ghurka, Migration and Thistle Lakes, at the southeastern end of Contwoyto Lake and extends southeasterly along the western margin of the Back River volcanic complex.

MUSKOX CLAIMS

Argus Resources Ltd.	Gold
200, 700 4th Ave. SW	76 C/15; 76 F/2
Calgary, Alta., T2P 3J4	65°02'N, 108°40'W

REFERENCES

Frith (1981a); Lord and Barnes (1954).
DIAND assessment reports: 082624, 082625.

PROPERTY

MUSKOX 1-6.

LOCATION

The claims are at "Esker Lake", 3 km north of Thistle Lake and 400 km northeasterly of Yellowknife.

HISTORY

The area, at the southeastern end of Contwoyto Lake (Ghurka, Migration and Thistle Lakes area) has not undergone much previous exploration (see Thistle and Regan Lakes Reconnaissance).

The MUSKOX 1-6 claims were recorded in September, 1986.

DESCRIPTION

The regional geology has been mapped by Frith (1981a) at 1:125 000 and south of latitude 65°N by Lord and Barnes (1954) at 1:253 440.

According to Frith (1981a), the staurolite-cordierite isograd passes through the eastern part of Esker Lake with higher grade rocks to the west.

CURRENT WORK AND RESULTS

In 1987 three adjoining grids (Fig. 8-24) were constructed south of "Esker Lake" on MUSKOX 2, 3, 4 and 6 claims. These grids were explored by 1:2500 geological mapping, magnetometer and VLF EM surveys. Soil samples collected from the western part of Grid 1 were analysed for gold and arsenic.

Rocks exposed on the grids include metasediments of the Yellowknife Supergroup, including biotite schist ± cordierite ± andalusite ± anthophyllite ± garnet. A broad zone of "garnet amphibolite" mapped as extending northeasterly from Grid 3 across Grid 1 and crossed by a VLF EM conductor coincident with a series of magnetic highs is probably in part a tightly folded mainly silicate iron formation with an overall northwesterly trend. Comparable VLF EM conductors and magnetic anomalies associated with amphibolite are found on Grid 2.

Small bodies of tonalite or diorite and granitic dykes intrude the Yellowknife Supergroup metasediments.

Three shallow trenches were excavated towards the eastern end of Grid 1, near "Sheit Lake", a 1.5 km-long lake in the southeastern corner of MUSKOX 4 claim. The trenches, excavated in sulphide-rich amphibolite, straddle the main VLF EM conductor and an associated magnetic anomaly. The highest gold assay, 60 g/t Au, was from a trench sample containing 1.01% As. The rock sampled is described as a quartz-flooded amphibolite, with quartz forming 10-20% of the rock and a black fine- to medium-grained matrix of bladed and acicular amphibole crystals. Sulphides (mainly pyrrhotite and arsenopyrite) formed 25-30% of the rock, with the pyrrhotite banded or in blebs.

The showing is hosted by metamorphosed silicate iron formation cut by quartz veins. However these cross-cutting quartz veins do not show any halo of wall rock alteration, manifested either by alteration of grunerite to hornblende adjacent to the veins or by concentration of arsenopyrite in the vicinity of the cross-cutting quartz veins, as is seen at Lupin Mine. Pockets or layers of arsenopyrite-rich rock in which coarse arsenopyrite crystals form 50% or more of the rock were noted, but these have no obvious spatial relationship to individual cross-cutting quartz veins.

The iron formation is locally garnetiferous. A felspathic rock with scattered biotite flakes a few metres from the showing is probably a dacitic tuff.

THISTLE AND REGAN LAKES RECONNAISSANCE

Argus Resources Ltd.	Gold
200, 700 4th Ave. SW	76 C/15; 76 F/1,2;
Calgary, Alta., T2P 3J4	76 G/4,7,8
	64°52'-65°20'N
	107°30'-109°00'W

REFERENCES

Frith (1981a); Frith and Hill (1975); Frith and Percival (1978); Lambert (1978, 1981); Lord and Barnes (1954); Seaton and Crux (1985); Seaton *et al.* (1987).

DIAND assessment reports: 017133, 017134, 017138, 017142, 017157, 017160, 060073, 080178, 080232, 080293, 080452, 080476, 080571, 081136, 081610, 081789, 081812, 081909.

PROPERTY

FIRE 1-8; MG 1-3; MUSKOX 1-6; Q 1; WASP 1, 2.

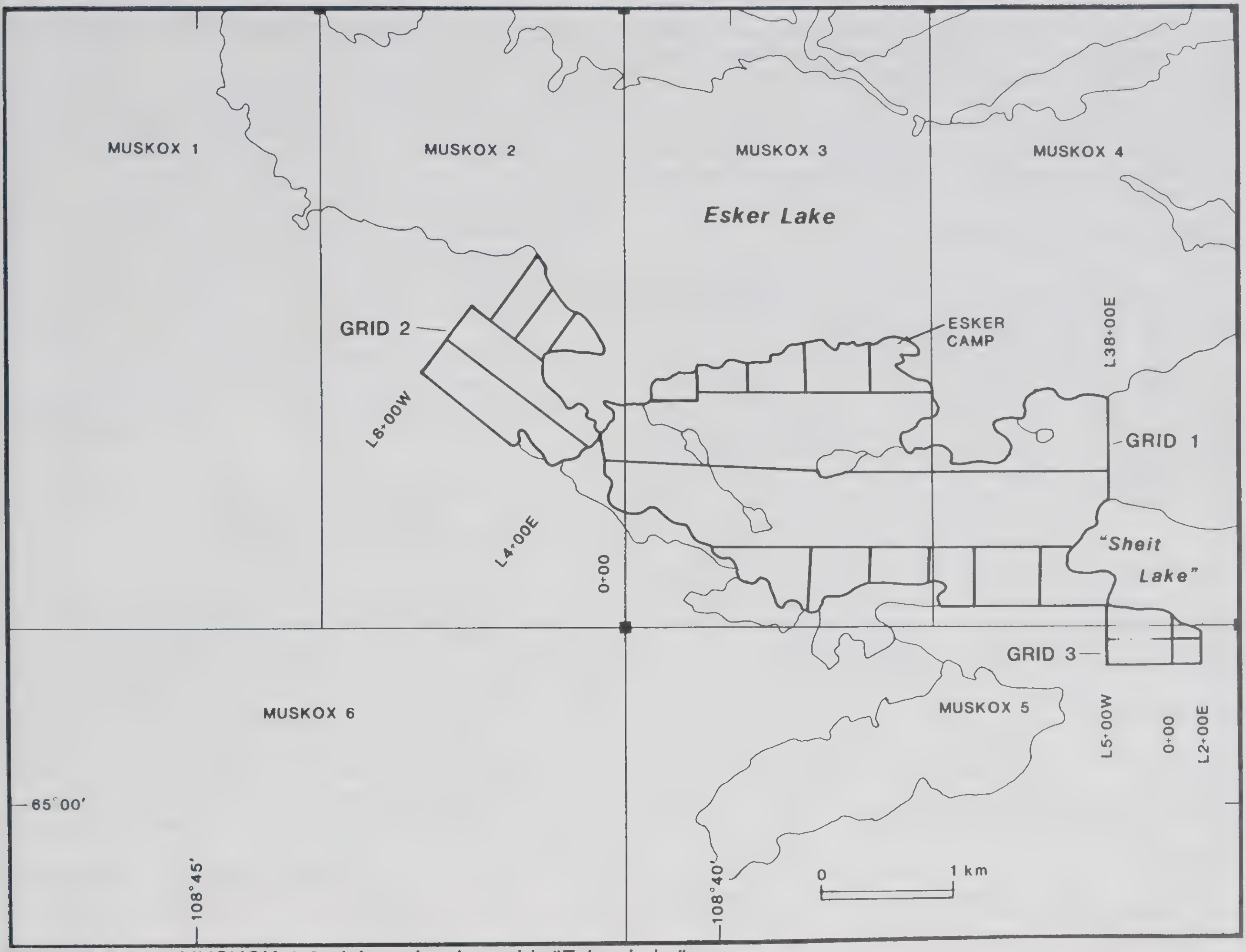


FIGURE 8-24: *MUSKOX 1-6 claims showing grids,"Esker Lake" area.*

LOCATION

The area reconnoitred is 390 km to 420 km northeasterly of Yellowknife. It extends 50 km from north to south and 70 km from east to west. The claims recorded during the reconnaissance are:

Claims	NTS	Latitude	Longitude
FIRE 1-8	76 G/4	65°05'N	107°45'W
MG 1-3	76 G/4	65°05'N	107°42'W
MUSKOX 1-6	76 C/15, 76F/2	65°02'N	108°40'W
Q 1	76 F/1	65°04'N	108°02'W
WASP 1,2	76 F/1,2	65°01'N	108°29'W

The FIRE, MG and MUSKOX claims are shown in Figures 8-23 and 8-24.

HISTORY

The Regan Lake area, in the eastern part of the area reconnoitred, has been extensively explored for gold and base metals since the 1940's. The history of exploration is detailed in the numerous assessment reports cited. Major companies involved in this exploration were Falconbridge Nickel Mines Ltd., Teck Corporation Ltd., Du Pont of Canada Exploration Ltd., Giant Yellowknife Mines Ltd. and Noranda Exploration Company Ltd. (SIDD claims, Seaton and Crux, 1985; Seaton *et al.*, 1987).

The western part of the reconnaissance area has been relatively little explored and only three of the assessment reports listed (080476, 080571, 080293) describe exploration in the Thistle Lake area (76 F/1 and 76 C/15). Bow Valley Industries Ltd. explored part of the western margin of the Back River volcanic complex.

FIRE 1-6, MG 1-3, MUSKOX 1-6, Q 1, WASP 1,2 were recorded in September 1986.

DESCRIPTION

The property is underlain mainly by: Yellowknife Supergroup metasediments ranging from greenschist to amphibolite grade; metavolcanics of the Back River volcanic complex and, along the area's northwestern margin, of the Hackett River volcanic belt; and several granitoid plutons which are generally ovoid in surface outline with maximum diameters of as much as 15 km. The Yellowknife Supergroup sediments are mainly greywacke-siltstone metaturbidites that are more highly metamorphosed in the western part of the area explored.

The Yellowknife Supergroup metasediments contain thin units of iron formation with local concentrations of arsenopyrite, pyrite and/or pyrrhotite. Such sulphidic iron formation is in places auriferous.

North of latitude 65°N the area has been mapped by Frith (1981a) at 1:125 000 and to the south by Lord and Barnes (1954) at 1:253 440. Lambert (1978, 1981) mapped the Back River volcanic complex.

CURRENT WORK AND RESULTS

The area was explored by reconnaissance geological mapping, rock and soil sampling. All samples (759 rock and 123 soil) were analysed for gold and arsenic.

Anomalous concentrations of gold were found in a variety of host rocks: intermediate to felsic volcanics, amphibolites, quartz-plagioclase-biotite-hornblende gneiss, biotite schist, gabbro and diorite, commonly in quartz-filled fractures with pyrite ± arsenopyrite ± pyrrhotite ± chalcopyrite. Selected areas were staked as a result of this work.

Petrographic studies were done on a few samples.

THISTLE LAKE AREA

Bow Valley Industries Ltd.	Gold
2020, 1177 W. Hastings St.	76 B/13; 76 C/16; 76 F/1
Vancouver, B.C., V6E 2K3	64°51'-65°03'N
	108°00'-108°30'W

REFERENCES

Lambert (1978, 1981); Lord and Barnes (1954); Seaton (1983a).

DIAND assessment report: 082070.

PROPERTY

BACK 1-5; BOW 1; GOOFY 1; JB 1-3; LOR 1-7; RING 1, 2, 3, 4.

LOCATION

The area is centred about 410 km northeasterly of Yellowknife.

HISTORY

Claims BOW 1, JB 1, 3 (Fig. 8-25), NTS sheets 76 C/16 and 76 F/1, were recorded in September, 1985 - BOW 1 to cover auriferous arsenopyrite-rich silicified and altered zones in mafic volcanics, and JB 1 and JB 3 to south and north of BOW 1 to secure possible on-strike extensions of these zone. The BACK, GOOFY, LOR and RING 1, 2 claims, and possibly RING 3, 4 on NTS sheet 76 B/13, were staked later in the summer of 1985 as a sequel to regional reconnaissance in the Thistle Lake area , and were recorded in December, 1985.

DESCRIPTION

The area reconnoitred extends along more than two-thirds of the southwestern margin of the Back River volcanic complex. Bow Valley Industries' claims staked along this margin form a continuous block which extends roughly 35 km northwesterly from Thlewycho Lake, where (in 1985) the property adjoined Cominco's FACE claims. The FACE claims adjoin the PALE claims where Cominco drilled a silver-lead-zinc showing in rhyolite in 1978.

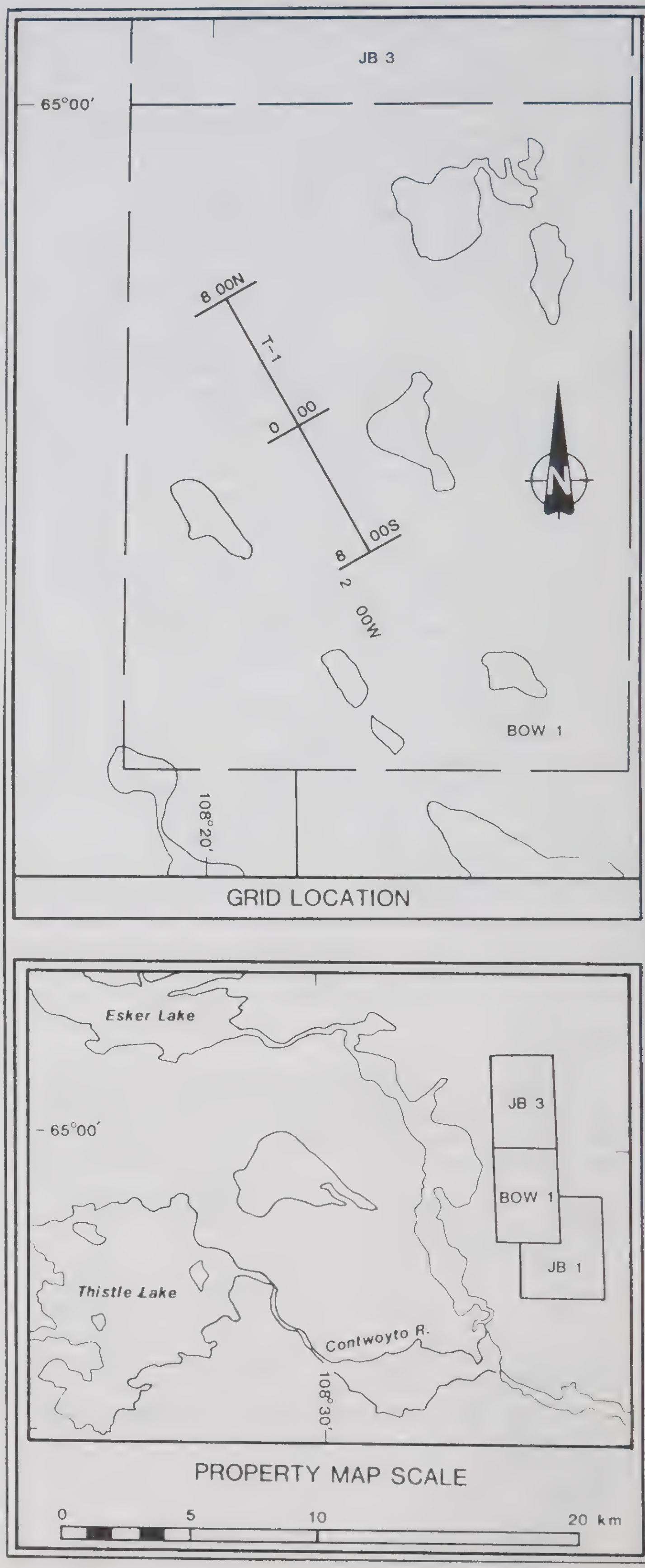


FIGURE 8-25: BOW 1 and JB 1,3 claims and grid, Thistle Lake area.

CURRENT WORK AND RESULTS

Regional geological reconnaissance and prospecting of the Thistle Lake area in 1985 was accompanied by 1:2 000 geological mapping, magnetometer and VLF EM surveys of a grid constructed over the BOW 1 claim auriferous zone (Fig. 8-25). In 1986, Welcome North Mines Ltd. became operator and a joint venture partner with Bow Valley Industries. They continued to explore the property by geological mapping, prospecting and by excavating several trenches on the BOW 1 claim. Though in one trench an assay of 16 g/t Au across 2 m was obtained, other trench samples gave much lower gold assays and the project was discontinued.

Gold is hosted by lensoid bodies of arsenopyrite-, pyrite-, and pyrrhotite-bearing silicate-facies iron formation in mafic to intermediate volcanics, at or near their contact with overlying metaturbidites.

POINT LAKE - ITCHEN LAKE - CONTWOYTO LAKE METASEDIMENTARY BELT

This belt of metasediments of the Contwoyto and the Itchen formations (Bostock, 1980), describes a northward convex arc on the northern side of the Central volcanic belt (also known unofficially as the Olga Lake volcanic belt).

The Contwoyto Formation, which contains amphibolite (metamorphosed iron formation) zones and lenses, is to the north, east and west of the Itchen Formation which generally contains no such amphibolite bodies. The areas underlain by Contwoyto Formation metasediments have been extensively staked for the gold potential of the amphibolite zones.

BUTTERFLY LAKE PROJECT

Cominco Ltd.	Gold
Suite 700, 409 Granville St.	76 E/10
Vancouver, B.C., V6C 1T2	65°30'30"-65°38'N
	110°27'-111°04'W

REFERENCES

Bostock (1980); Fraser (1964); King *et al.* (1988); Tremblay (1976); Seaton and Crux (1985); Seaton, Brophy and Crux (1987).

DIAND assessment reports: 017119, 017120, 017132, 017167, 081735, 081757, 081170, 081942, 081943, 081944, 081945, 081951, 081952, 082094, 082105, 082361, 082520, 082545.

PROPERTY

AU 15, 19, 23, 24, CTL 1, DIGGER 1, 2, JON 1-13, NC 1, DTC 1, SAM 1, 2.

LOCATION

"Butterfly Lake", so called on account of an esker which splits it into two wings joined by a narrow channel, is mainly encompassed by AU 24 (Fig. 8-26) 395 km northeasterly of Yellowknife and 3 km southeasterly of Lupin Mine. The centre of Butterfly Lake is roughly 4 km east of Contwoyto Lake.

HISTORY

Prospecting Permit 33 (76 E/10) was granted to Canadian Nickel Company Ltd. in 1962. An aeromagnetic survey was done over the permit area in 1962. Follow-up geological and geophysical surveys over grids were done from 1962 to 1964. The permit lapsed in 1964 (DIAND assessment reports: 017119, 017120, 017167; Seaton, Brophy and Crux, 1987).

AU 15, 18 and 19 were recorded by G. Sage in February 1981, transferred to Shell Canada Resources in March 1981, and to Highwood Resources Limited in January 1983. In February 1983, Highwood Resources transferred the claims to Amhawk Resource Corporation, which in September 1985 transferred them to Cominco Limited.

AU 23 and AU 24 were recorded by G. Sage and transferred to Shell Canada Resources Limited in February 1981. In January 1983, Shell Canada Resources transferred the claims to Highwood Resources Limited, which in April 1984 transferred them to Westsun Petroleums and Minerals Limited. Westsun returned the claims to Highwood in May 1985, which in August 1985 transferred them to Cominco.

Cominco recorded CTL 1 in March 1983. DIGGER 1 was recorded and transferred to D.G. Thomas in March 1983. The following month it was transferred to Cominco.

NC 1 was recorded by P. Hungle in March 1983 and transferred to D.G. Thomas the following July. In August 1983 it was transferred to Wellington Resources Limited, which in February 1984 became Gyro Energy and Minerals Corporation. After completing geological and geophysical surveys of a grid on NC 1 in 1983 (DIAND assessment report 081757), Gyro transferred the claim to Cominco in June 1985. The history of PTC 1 is the same as that of NC 1 except that assessment work was not filed until after transfer to Cominco.

SAM 1 and 2 were recorded by P. Hungle in March 1983, transferred to Roxwell Gold Mines in February 1984. Roxwell transferred the claims to Cominco in April 1985.

The JON claims were staked for Cominco Limited: JON 1, 2 in August 1985, JON 3, 4 in December 1985, JON 5, 6 in September 1986, JON 7-11 in July 1987 and JON 12, 13 in October 1987.

With the exception of the CTL 1 and JON claims that were staked for Cominco, most claims were not acquired by Cominco until 1985, and although numerous transfers had taken place, only in the case of the NC 1 claim was assessment work filed prior to acquisition by Cominco. Cominco's work is detailed in the numerous assessment reports cited and briefly summarised in Seaton and Crux (1985) and Seaton, Brophy and Crux (1987).

The large block of claims staked and otherwise acquired by Cominco is currently being explored by Cominco Limited and Cogema Canada Ltd. in joint venture.

DESCRIPTION

The property is underlain primarily by Archean metasediments of the Yellowknife Supergroup with lenses of garnet- and amphibole-rich iron formation. Granitic and diabase dykes, generally northwesterly trending, intrude the sediments which also have an overall northwesterly strike though less northerly than the dykes. The region has been mapped by Fraser (1964), Tremblay (1976) and Bostock (1980) at 1:506 880, 1:50 000 and 1:250 000 respectively. It is under ongoing study by the Geological Survey of Canada (King *et al.*, 1988).

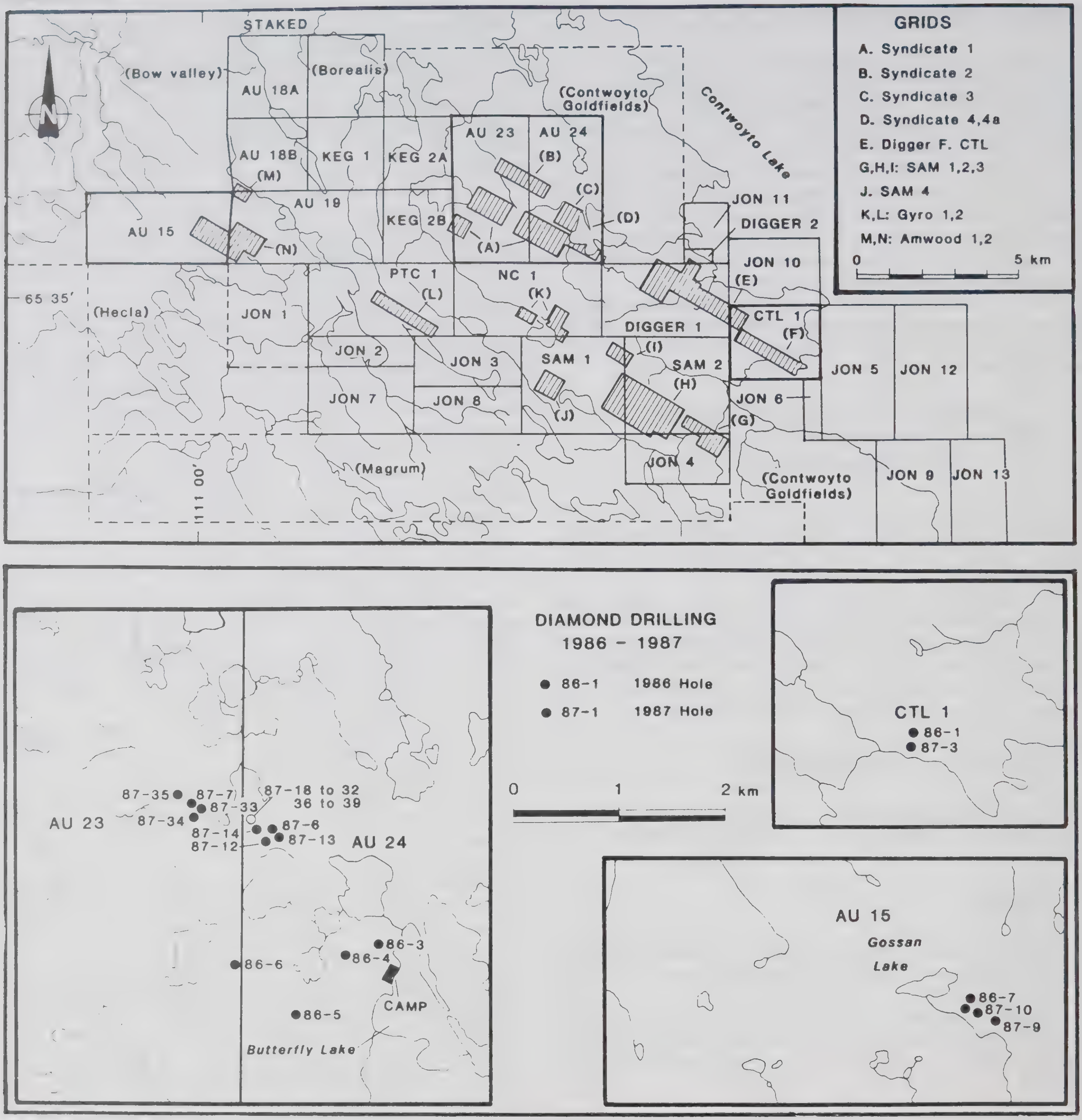


FIGURE 8-26: "Butterfly Lake" area, AU, CTL, DIGGER and other claims; grids and diamond drill holes.

CURRENT WORK AND RESULTS

In 1986 geophysical, geological and geochemical surveys were conducted on several grids and 12 holes were drilled. The grids are shown in Figure 8-26. Table 8-4 shows the nature and amount of geophysical surveying done on each grid.

A total of 1002 m in 13 holes was drilled in 1986. Of these, one hole was abandoned at 17 m and redrilled. The distribution of these diamond drill holes between the various grids is shown in Figure 8-26.

In 1987, 14 diamond drill holes were completed (Fig. 8-26). Encouraging intersections of auriferous core on the AU 23 and 24 claims northwesterly of Butterfly Lake has spurred further exploration, including drilling.

TABLE 8-4: SUMMARY OF 1986 WORK ON BUTTERFLY LAKE PROJECT

Grid	Claims(s) Covered	Lines Line-km	HLEM Line-km	Magnetics Line-km
Amwood 1	AU-19	3.2	2.4	2.6
Amwood 2	AU-15, AU-19	12.0	9.3	9.9
Ctl	CTL	19.0	13.0	16.0
Digger	DIGGER 1	17.0	10.0	14.8
Gyro 1	NC-1	7.5	4.5	6.5
Gyro 2	PTC-1	9.5	7.0	8.0
Sam 1	SAM-2, JON-4	7.0	4.4	5.6
Sam 2	SAM-1, SAM-2	31.0	20.5	29.0
Sam 3	AU-23	3.5	2.3	2.5
Sam 4	SAM-1	7.0	4.4	5.6
Syndicate 1	AU-23, AU-24	24.0	10.0	20.1
Syndicate 2	AU-24	6.6	4.5	5.2
Syndicate 3	AU-23	4.0	3.0	3.3
TOTALS		148.3	93.2	126.4

In addition, soil sampling was done on the AMWOOD 1 and 2, DIGGER, SAM 1, 2 and 3 and 4, and the SYNDICATE 1 and 2 grids though details and results of this work were not reported.

ISLAND CLAIM

Highwood Resources Ltd.
1660, 540 5th Ave. SW
Calgary, Alta., T2P OM2

Gold
76 E/10
65°42'20"N
110°56'20"W

REFERENCES

Bostock (1980); Fraser (1964); King *et al.* (1988); Tremblay (1976).
DIAND assessment reports: 017119, 017120, 017167, 082583.

PROPERTY

ISLAND.

LOCATION

The ISLAND claim covers most of an island in Contwoyto Lake, 400 km northeasterly of Yellowknife and 15 km southeasterly of Lupin Mine.

HISTORY

Canadian Nickel Company Ltd. acquired Prospecting Permit 33 covering 76 E/10 in 1962 and from 1962 to 1964 explored it for gold (DIAND assessment reports: 017119, 017120, 017167). In the southern part of the island now staked as the ISLAND claim, a sample taken adjacent to a diabase dyke assayed 13 g/t Au. This showing and a small surrounding area in the south of the island was covered by a grid on which geological mapping and a magnetometer survey were done in 1964.

Little exploration was done in the area until 1982 when the opening of Lupin Mine and a concurrent renewal of interest in gold exploration resulted in a staking rush in the Contwoyto Lake area.

M. Senkiw recorded the ISLAND claim in November 1983 and transferred it to Highwood Resources Limited in January 1984.

DESCRIPTION

The area was geologically mapped at 1:506 880 by Fraser (1964) as part of a regional helicopter supported reconnaissance. The adjoining area west of longitude 111°W was mapped at 1:50 000 (Tremblay, 1976) and Tremblay's mapping is included in the larger area mapped by Bostock (1980) at 1:250 000.

The ISLAND claim is probably largely underlain by Yellowknife supergroup metasediments intruded by north-northwesterly trending diabase dykes of the Mackenzie Swarm. Most bedrock on the ISLAND claim is covered by glacial deposits, however.

CURRENT WORK AND RESULTS

In 1987 work was performed by Aber Resources Limited by agreement with Highwood Resources Limited. A grid was constructed across the entire ISLAND claim and surveyed by magnetometer and horizontal loop EM.

The total field magnetometer survey outlined three anomalies that were attributed to diabase dykes. Two elongate but shorter anomalies are unexplained.

ROX VOX PROJECT

Parklane Technologies Ltd.
c/o Taiga Consultants Ltd.
Suite 400
534 17th Ave. SW
Calgary, Alta., T2S OB1

Gold
76 E/10
65°40'N, 110°56'W

REFERENCES

Bostock (1980); Fraser (1964); Tremblay (1976).
DIAND assessment reports: 017120, 017167, 082241, 082527.

PROPERTY

ROX 1; VOX 1.

LOCATION

The claims (Fig. 8-27) are 395 km northeasterly of Yellowknife and cover most of a small peninsula on the west shore of Contwoyto Lake at the mouth of Shallow Bay.

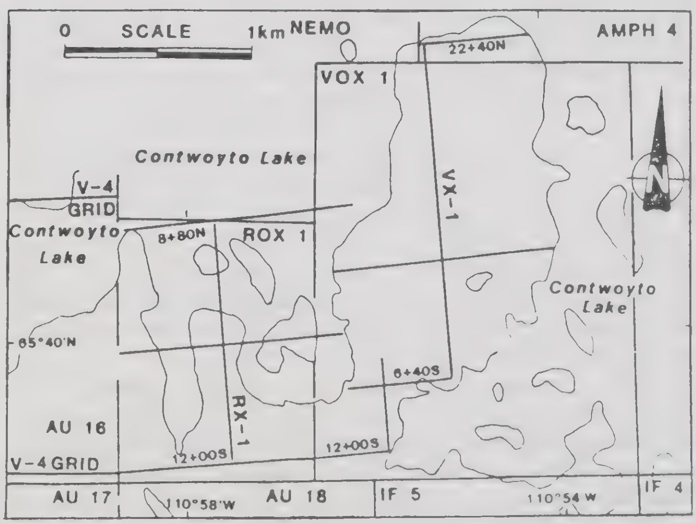


FIGURE 8-27: *ROX 1, VOX 1 and grids.*

HISTORY

From 1962 to 1964 Canadian Nickel Company Limited mapped and explored their Prospecting Permit 33 which covered NTS 76 E/10 (DIAND assessment reports: 017120, 017167). Following a 1962 airborne magnetometer survey, grids were constructed over a number of anomalies, which were then tested by ground geophysical surveys. These included a magnetometer survey of a grid in the northern part of the area later staked as VOX 1. Canadian Nickel Company tested an amphibolitic zone on this grid by three diamond drill holes, for which gold assays were not reported.

ROX 1 and VOX 1 were recorded by D.G. Thomas in March 1983, and optioned to Parklane Explorations Inc. in October 1986. In September 1986 the company became Parklane Technologies Limited.

DESCRIPTION

The only published map covering the area is in Fraser (1964) at a reconnaissance scale of 1:506 880. More detailed mapping at 1:250 000 (Bostock, 1980) and 1:50 000 (Tremblay, 1976) cover adjoining areas to the west. The ROX 1 and VOX 1 claims are largely underlain by Archean metaturbidites which locally contain silicate (locally sulphidic) iron formation units. The pelitic component of the metasediments is metamorphosed to cordierite-biotite schist. The metasediments are cut by numerous north-northwesterly trending Helikian diabase dykes of the Mackenzie Swarm.

CURRENT WORK AND RESULTS

In 1986 the project was managed by Covello Consulting of Yellowknife. Focusing on auriferous iron formation, grids were constructed with north oriented baselines, covering almost all of the dry land parts of ROX 1 and VOX 1. Both ROX 1 and VOX 1 grids were explored by VLF EM, total field magnetic and magnetic gradient surveys. The VOX 1 grid was geologically mapped at 1:2 500. Extensive overburden on the ROX 1 grid obscures bedrock geology.

Eight geophysical anomalies were outlined on the ROX 1 grid, and five major anomalous zones on VOX 1. Mapping shows those on VOX 1 to be coincident with zones of iron formation which are commonly complexly folded. Magnetic anomalies locally coincide with zones of iron formation, though much stronger and more persistent magnetic features are caused by diabase dykes. VLF EM conductors on the ROX 1 grid trend northerly. On the VOX grid two conductors that trend northeasterly coincide with anomalous magnetic trends and iron formation zones. Thirty-nine samples of iron formation from the VOX 1 grid yielded disappointing gold assays. In 1987 Taiga Consultants Limited operated the exploration. Detail "fill-in" grids with 40 m line separation and station spacing were constructed over the geophysical anomalies delineated in 1986. Soil geochemical sampling for gold was completed on each detail grid. Detail grids and certain areas on strike from anomalous geophysical trends were tested by prospecting and lithogeochemical sampling. Of 190 rock samples collected, only three were from the ROX 1 claim. Seven rock samples contained more than 500 ppb Au; five of these were from one anomaly. Three soil samples from the ROX 1 grid contained more than 50 ppb Au. A VLF EM survey on two detail grids on VOX 1 did not outline any conductors.

AU 15

Cominco Ltd.	Gold
Suite 700, 409 Granville St.	76 E/10,11
Vancouver, B.C., V6C 1T2	65°36'N, 111°01'W

REFERENCES

Bostock (1980); Tremblay (1976); Seaton and Crux (1985); Seaton *et al.* (1987).

DIAND assessment reports: 018870, 018951, 018952, 082524.

PROPERTY

AU 15.

LOCATION

The AU 15 claim (Figs. 8-26, 8-28) is 390 km northeasterly of Yellowknife and 7 km south of Shallow Bay, Contwoyto Lake.

HISTORY

AU 15 was recorded in February 1981. Cominco optioned the claim from Amhawk Resources Limited in 1985. A more detailed historical summary may be found in Seaton and Crux (1985) and Seaton *et al.* (1987). A record of work done on the AU 15 claim and adjoining claims is in the assessment reports cited.

DESCRIPTION

The area has been mapped at 1:250 000 by Bostock (1980), by Tremblay (1976) at 1:50 000 and Fraser (1964) at 1:506 880.

The claim is underlain by metaturbidites of the Contwoyto Formation. The more pelitic parts are nodular quartz-plagioclase-biotite schists with cordierite, andalusite and staurolite porphyroblasts. Lenses of amphibolitic locally garnetiferous or sulphidic silicate facies iron formation are in the Contwoyto Formation metasediments. Gold is associated with sulfide-bearing iron formation. A small pluton of granite intrudes the metasediments in the southern part of AU 15. Northwesterly

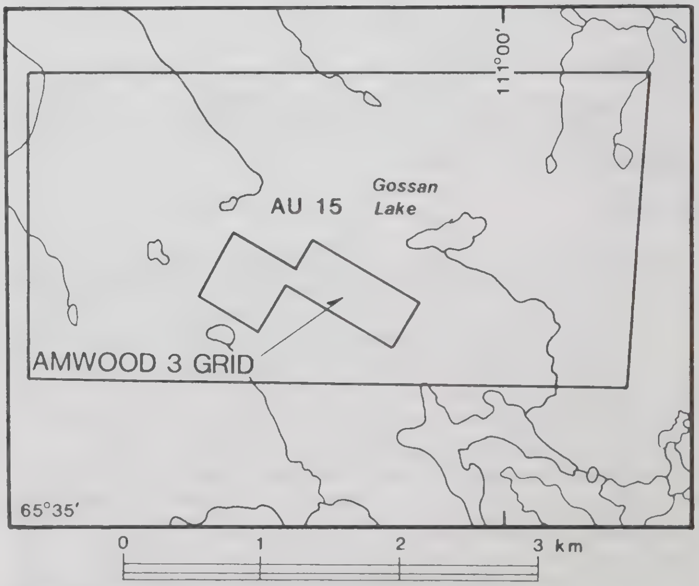


FIGURE 8-28: AU 15 claim and grid.

trending diabase dykes of the Mackenzie Swarm cut all other rock units.

CURRENT WORK AND RESULTS

In 1987 horizontal loop EM and total field and magnetic gradient magnetometer surveys were conducted on the Amwood Grid in the south-central part of AU 15 (Fig. 8-28).

BUCKET, IF, AND JEMIMA CLAIMS

Contwoyto Goldfields Ltd.	Gold
c/o Fair and Weir	76 E/10,11
Suite 1660,	65°31'-65°40'N
444 5th Ave. SW	110°32'-111°04'W
Calgary, Alta., T2P 2T8	

REFERENCES

Bostock (1980); Fraser (1964); King *et al.* (1988); Tremblay (1976).

DIAND assessment reports: 017119, 017120, 017132, 017167, 017206, 082122, 082123, 082124, 082125, 082126, 082127.

PROPERTY

BUCKET 1; IF 1, 3, 4; JEMIMA 1.

LOCATION

The claims (Fig. 8-29) are from 385 km to 400 km northeasterly of Yellowknife. All, except JEMIMA 1, are on the southwestern shore of Contwoyto Lake. The claims cover three discrete areas, the largest of which is that covered by BUCKET 1, IF 3 and IF 4.

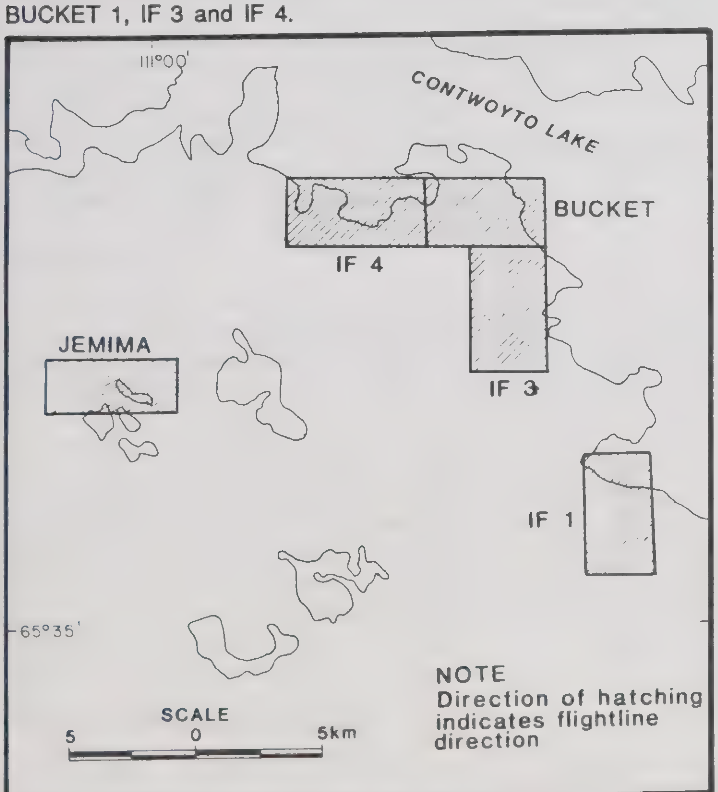


FIGURE 8-29: BUCKET, IF and JEMIMA claims and airborne geophysical grids.

HISTORY

Canadian Nickel Company Limited acquired Prospecting Permit 33, covering 76 E/10 in 1962 and from 1962 to 1964 explored it for gold as detailed in DIAND assessment reports 017119, 017120 and 017167. In the vicinity of JEMIMA 1 and to its north in the Gossan Lake area (currently staked as AU 15) Roberts Mining Company did geological mapping and geophysical surveys (DIAND assessment reports: 017132, 017206) on the DUD, HAR and other claim groups in 1962 and 1963. IF 1, 3 and 4 were recorded by M. Magrum in September 1983. The IF claims were transferred to 305314 Alberta Limited, which in February 1986 transferred ownership to its successor Contwoyto Goldfields Limited.

BUCKET 1 was recorded by B. Weir in September 1985. In November 1985 B. Weir transferred the claim to G. Thomas, who in December 1985 transferred it to 305314 Alberta Limited. In February 1986 BUCKET 1 was transferred to Contwoyto Goldfields Limited.

JEMIMA 1 was recorded by G. Thomas in October 1984, transferred to 305314 Alberta Limited in December 1985 and transferred to Contwoyto Goldfields Limited in February 1986.

DESCRIPTION

The claims are underlain mainly by Archean metasediments of the Contwoyto Formation cut by numerous northwesterly trending diabase dykes of the Mackenzie Swarm. Locally the metasediments contain lenses and zones of garnet- and/or amphibole-rich iron formation.

West of longitude 111°W the area has been mapped by Fraser (1964), Tremblay (1976) and Bostock (1980) at 1:506 880, 1:50 000 and 1:250 000 respectively and is under ongoing study by the Geological Survey of Canada (King *et al.*, 1988).

East of longitude 111°W the area has been geologically mapped at 1:506 880 (Fraser, 1964), and Prospecting Permit 33 (NTS 76 E/10) was mapped at a more detailed scale by Canadian Nickel Company in 1962 (DIAND assessment report 017119).

CURRENT WORK AND RESULTS

In 1986 the three areas were explored by helicopter-borne geophysical surveys (DIGHEM III). Conductors were delineated on all claims. The most obvious magnetic features are caused by northwesterly trending diabase dykes of the Mackenzie Swarm. The surveys are reported and results interpreted in DIAND assessment reports 082122 to 082127.

JOHN, SHIN, DLER PROJECT

Hecla Mining Company of Canada Ltd.	Gold
P.O. Box 49200	76 E/10,11,14,15
Bentall Centre Postal Sta.	65°29'-65°54'N
Vancouver, B.C., V7X 1L1	110°30'-111°08'W

REFERENCES

Bostock (1980); Fraser (1964); King *et al.* (1988); Seaton *et al.* (1987); Tremblay (1976).

DIAND assessment reports: 017119, 017120, 017154, 017156, 017162, 017167, 081974, 082131, 082334, 082596.

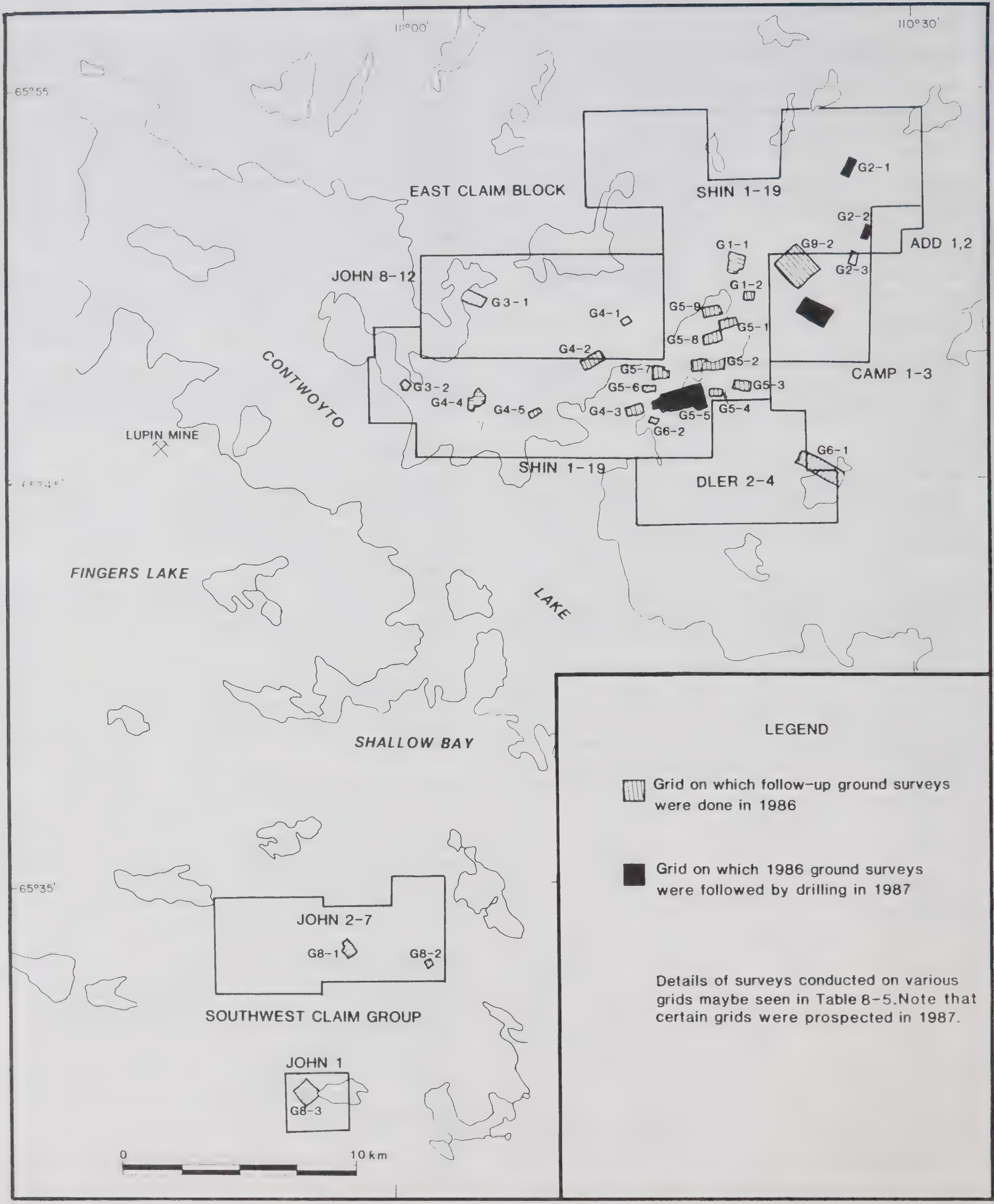


FIGURE 8-30: *JOHN, SHIN, DLER, ADD and CAMP claims and grids.*

PROPERTY

ADD 1, 2; CAMP 1-3; DLER 1-4; JOHN 1-12; SHIN 1-19.

LOCATION

The property (Fig. 8-30) comprised three discrete parts: JOHN 1 and JOHN 2-7 on the southwestern side of Contwoyto Lake; and the remaining claims on the northeastern side forming a large block. An arm of Contwoyto Lake extends northeasterly through the central part of this main block and a base camp has been maintained at the northeastern end of the arm. The base camp is 415 km northeasterly of Yellowknife and 30 km east-northeasterly of Lupin Mine.

HISTORY

The claims cover ground formerly held as Prospecting Permit 33 (76 E/10) and Prospecting Permit 35 (76 E/15) by Canadian Nickel Company Ltd. from 1962 to 1964. An airborne magnetometer survey was followed up by ground magnetometer surveys and geological mapping (DIAND assessment reports: 017119, 017120, 017154, 017156, 017162, 017167). The permits expired in 1964.

The JOHN, SHIN and DLER claims were recorded by B. Weir: SHIN 1-19 in November 1983, JOHN 1-7 in December 1985. They were transferred in March 1984 to Schindler Exploration Consultants Ltd., in June 1985 to 305314 Alberta Ltd. which became Contwoyto Goldfields Ltd., and later in June 1985 to Hecla Mining Company of Canada Ltd. CAMP 1-3 were recorded by J. Schindler in July 1986 and transferred to Hecla in September 1986. ADD 1 and 2, recorded by J. Schindler in September 1987 were not transferred to Hecla until December 1988.

By the end of 1987 the property had decreased slightly in size by the lapse of JOHN 2, SHIN 13, 15, 16 and by reduction in area of JOHN 3, JOHN 9-11, SHIN 11 and DLER 1. Ownership of the northern part of JOHN 6, which adjoins AU 15, AU 23, 24, CTL 1, DIGGER 1, PTC 1, SAM 1, 2 claim block currently under exploration by a Cominco-COGEMA joint venture, is under dispute.

In 1985, helicopter-borne EM (DIGHEM), EM magnetometer and VLF EM surveys were flown over JOHN 1, JOHN 2-7, 8-12, SHIN 1-19, DLER 1-4 (Seaton *et al.*, 1987).

DESCRIPTION

The property area is underlain predominantly by Yellowknife Supergroup metasediments of the Contwoyto Formation. These mainly turbiditic metasediments contain lenses of iron formation, and are intruded by Kenoran granitic plutons and dykes, and by Proterozoic diabase dykes, mostly of the northwesterly trending Mackenzie swarm. The metasediments are of amphibolite facies except in the northeastern part of the property which is underlain by greenschist facies rocks. Fraser (1964), Tremblay (1976) and Bostock (1980), mapped the area (west of longitude 111°W) at 1:506 880, 1:50 000 and 1:250 000 respectively. East of longitude 111°W, 76 E/10 and 76 E/15 were in part geologically mapped by Canadian Nickel Company in the early 1960's (DIAND assessment reports: 017119, 017120).

CURRENT WORK AND RESULTS

In 1986, anomalies delineated by a 1985 airborne geophysical survey were evaluated. Grids were constructed over geophysical anomalies the locations of which are shown in Figure 8-30. Work done on these grids is listed in Table 8-5. Seventy-eight out of 363 conductors detected by airborne EM and VLF EM were tested by ground geological or geophysical surveys, and in the course of this work 327 rock samples were assayed for gold by fire assay - atomic adsorption method. Most assays were low, some below the detection limit of the method. The maximum assay was 2120 ppb Au. On the northeastern side of Contwoyto Lake 56 iron formation zones were mapped. None were mapped on the southwestern side of the Lake where iron formation may be hidden by extensive overburden on the JOHN 1 and JOHN 3-7 claims. Iron formations on four grids (4-4, 4-5, 5-5 and 9-1) have anomalously high gold concentrations.

For the most part, the iron formations trend east-northeasterly to northeasterly, except on CAMP 1, 2 in the eastern part (Grids 9-1 and 9-2) and SHIN 17, 18 in the northeastern part (Grid 2-1) of the property where geophysical results suggest folding.

In 1987 work included prospecting, geophysical surveys and diamond drilling and a petrographic examination of thin sections of 15 rock samples.

A total of 5529 m was drilled in 17 holes: eight on Grid 5-5, five on Grid 2-1, three on Grid 2-2 and one on Grid 9-1. The most encouraging results were obtained from prospecting and drilling on Grid 5-5 where samples from sulphide-rich boulders of amphibolitic iron formation ranged from 3.4 to 28.1 g/t Au. Though weak concentration of gold (2.31 g/t) was intersected over as much as 7.85 m of core, in one hole on Grid 5-5, other holes on this grid intersected much narrower auriferous zones, all under 1 m and mostly under 0.5 m wide. A maximum assay of 25.57 g/t Au across 0.3 m was recorded.

Graphitic beds may be the main cause of some of the airborne EM anomalies, as for example on Grid 2-1. Grids 6-2 and 9-2 were constructed in 1987. Grids 4-5, 5-5, 6-2, 9-1, 9-2 and claim JOHN 12 were prospected in 1987. VLF EM and SP surveys were done on Grids 2-1, 5-5, 6-2, 9-1 and 9-2.

OP Claims

Bow Valley Industries Ltd.	Gold
2020 - 1177 W. Hastings St.	76 E/10,11,14,15
Vancouver, B.C., V6E 2K3	65°44'N, 111°00'W

REFERENCES

Barager and Hornbrook (1963); Bostock (1980); Fraser (1964); King *et al.* (1988); Seaton (1984); Seaton and Crux (1985).

DIAND assessment reports: 017119, 017120, 017167, 017211, 017231, 081474, 081758, 082068.

PROPERTY

OP 1-3.

LOCATION

The claims (Figs. 8-31, 8-32) are at Contwoyto Lake and 395 km northeasterly of Yellowknife. They are 10 km southeasterly of Lupin Mine.

HISTORY

Most of the area covered by the OP 1-3 claims was staked as part of the BOX claim block by Conwest Exploration Company Ltd. in 1961. Falconbridge Nickel Mines Ltd. optioned the BOX claims and explored them between 1961 and 1963 (DIAND assessment reports: 017211, 017231). Work included geological mapping, magnetometer surveys, trenching and diamond drilling of 3 holes.

TABLE 8-5: EXPLORATION ON JOHN, SHIN, DLER PROJECT IN 1986 (Modified from DIAND Assessment Report 082596).

GRID	GRIDDING BASE LINE LINES (l-km)	TOTAL FIELD & VERTICAL GRADIENT MAGNETICS (l-km)	VLF-EM TRANSMITTER (l-km)	HLEM C.S.=50 m (l-km)	HLEM C.S.=100 m (l-km)	HLEM C.S.=150 m (l-km)	SP (l-km)	GEOLOGICAL MAPPING
G1-1	1.100, 13.200	14.300	NLK, 11.300	--	13.025	3.175	5.375	In part-west side of grid only.
G1-2	0.100, 1.050	--	NLK, (1.050)	--	--	--	--	Not done-no bedrock exposed.
G2-1	1.100, 13.600	15.425	NLK, 12.287	--	13.250	--	10.250	Completed-outcrop rare.
G2-2	1.400, 10.425	11.825	NAA, 10.550	--	9.925	--	2.800	Completed-boulder fields and frost heave only.
G2-3	0.500, 2.625	3.137	NLK, 2.562	--	--	--	1.050	Completed-frost heave only.
G3-1	1.200, 7.525	8.637	NAA, 7.525	--	7.350	4.075	3.175	Not done.
G3-2	1.800, 3.700	5.500	NAA, 3.775	--	4.950	--	1.750	Completed.
G4-1	0.300, 3.000	3.300	NAA, 3.000	--	3.000	--	2.300	Completed.
G4-2	1.200, 6.300	7.450	NLK, 6.500	--	6.275	--	--	Completed.
G4-3	1.200, 7.800	3.550	NAA, 7.875	--	.525	5.625	--	Not done-grid on lake ice.
G4-4	0.950, 6.75	6.537	NAA, 7.700	--	--	5.487	1.625	Completed.
G4-5	0.500, 3.000	3.500	NLK, 3.150	--	3.000	--	--	Completed.
G5-1	1.000, 5.500	6.525	NAA, 5.500	--	5.525	--	2.200	Completed-much of grid on lake ice.
G5-2	1.900, 10.750	12.475	NAA, 10.750	--	10.800	2.700	4.950	Completed.
G5-3	0.700, 4.000	4.700	NAA, 4.000	--	4.000	--	1.250	Completed.
G5-4	1.000, 6.500	7.224	NAA, 6.350	--	5.750	2.925	7.000	Completed.
G5-5	2.700, 29.300	31.388	NAA, 29.275	1.225	29.450	0.475	18.675	Completed.
G5-6	0.500, 3.000	3.500	NAA, 3.000	--	--	4.300	--	Not done-grid on lake ice.
G5-7	1.000, 8.200	9.200	NAA, 8.200	--	4.050	9.100	--	Not done-grid on lake ice.
G5-8	0.500, 3.000	3.500	NAA, 3.000	--	0.500	3.575	--	Not done-grid on lake ice.
G5-9	0.900, 5.800	7.000	NAA, 5.800	--	6.475	0.750	--	Not done-grid on lake ice.
G6-1	1.900, 12.000	14.550	NAA, 11.675	--	10.950	3.600	1.850	Completed.
G8-1	0.900, 4.400	5.275	NSS, 4.500	--	4.400	--	--	Completed-boulder fields and frost heave only.
G8-2	0.500, 1.850	2.862	NSS, 2.350	--	2.225	--	--	Completed-no outcrop, one boulder field.
G8-3	1.000, 8.775	9.775	NLK, 8.775	--	9.550 4.675	--	--	Completed.
G9-1	1.000, 13.250	14.587	NAA, 13.250	--	12.650	--	10.275	Completed.
TOTAL:	27.650 145.500	215.725	192.650	l.225	172.300	45.787	74.525	
				GRAND TOTAL of HLEM: 219.312				

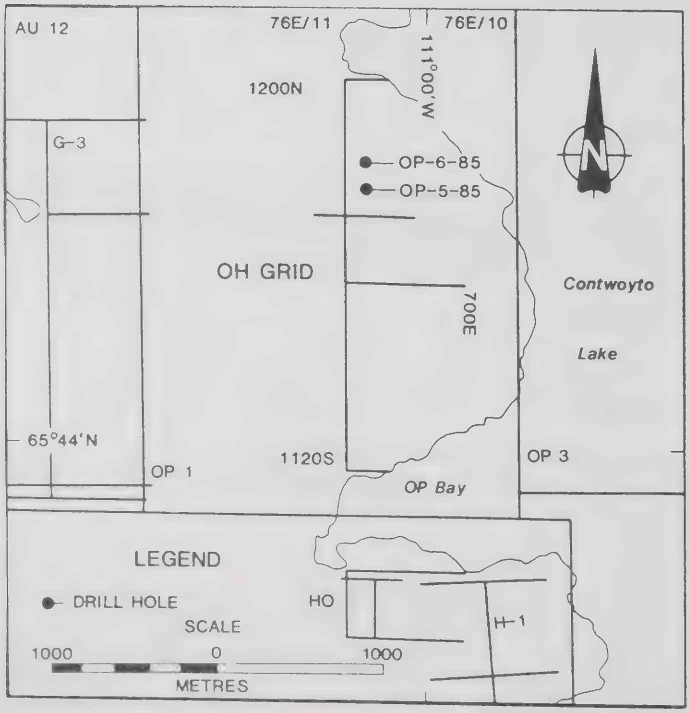


FIGURE 8-31: *OP claims, grids and 1985 drill holes.*

The eastern margin of the OP claim group was held from 1962 to 1965 as Prospecting Permit 33, which covered 76 E/10. Exploration of Prospecting Permit 33 is recorded in DIAND assessment reports 017119, 017120 and 017167. Work in the OP property area is also summarised in Baragar and Hornbrook (1963), Seaton (1984) and Seaton and Crux (1987).

From 1965 to 1980 work was not reported for the area covered by OP 1-3. In January 1980, M. Magrum recorded the IGOR 1 claim for Oxen Engineering Ltd. The claim name was changed to OP 1 and the claim transferred to OP Resources Ltd. who in July 1983 recorded OP 2 and 3.

A geochemical survey of the IGOR claim is recorded in DIAND assessment report 081474. Report 081758 details geological mapping, geophysical surveys, trenching and drilling by OP Resources in 1983.

In 1985 Bow Valley Industries by agreement with OP Resources Ltd. explored the claims by ground follow-up of an airborne EM (Input) and magnetometer survey. This work is reported in DIAND assessment report 082068.

OH Grid, consisting of 20.5 km of line, was constructed over an Input conductor coincident with the Main and the Valley iron formation zones. The grid was geologically mapped and explored by geological mapping magnetometer, vertical magnetic gradient, and HLEM surveys. The northernmost 3.7 km of grid was surveyed by VLF EM. Fifty-one grab samples were assayed for gold.

Two diamond drill holes totalling 175 m drilled on the Main Zone, intersected encouraging gold concentrations over maximum width of 1.04 m.

DESCRIPTION

The property is mainly underlain by Archean metagreywacke of the Contwoyto Formation, which contains iron formation lenses that are locally auriferous. The regional geology west of longitude 111°W has been mapped by Tremblay (1976) at 1:50 000. Tremblay's mapping is incorporated in the 1:250 000 map in Bostock (1980). East of 111°W the only published map of the area is that of Fraser (1964) at 1:506 880 scale. Mapping at a larger scale by Falconbridge Nickel Mines covering much of 76 E/10 is recorded in DIAND assessment reports 017119 and 017120.

Metasediments strike northerly through the OP claims and are cut by diabase dykes of the Helikian Mackenzie Swarm.

Progress of mapping by the Geological Survey of Canada in the Contwoyto Lake area is given in King *et al.* (1988).

CURRENT WORK AND RESULTS

In 1986 Bow Valley Industries did HLEM surveying and drilled one hole on the OH Grid.

GOLD AND JON AIRBORNE SURVEYS

Cominco Ltd.
Suite 700, 409 Granville St.
Vancouver, B.C., V6C 1T2

Gold
76 E/10,14,15

REFERENCES

Bostock (1980); Fraser (1964); Tremblay (1976).
DIAND assessment reports: 017120, 017167, 082516.

PROPERTY

GOLD 2-4; JON 1-3; JON 5-8.

LOCATION

Three blocks of claims are from 385 km to 415 km northeasterly of Yellowknife (Fig. 8-32):

Area	Claim	Lat.	Long.
1	JON 1-3,7,8	65°34'N	110°53'W
2	JON 5,6	65°34'N	110°36'W
3	GOLD 2-4	65°52'N	110°58'W

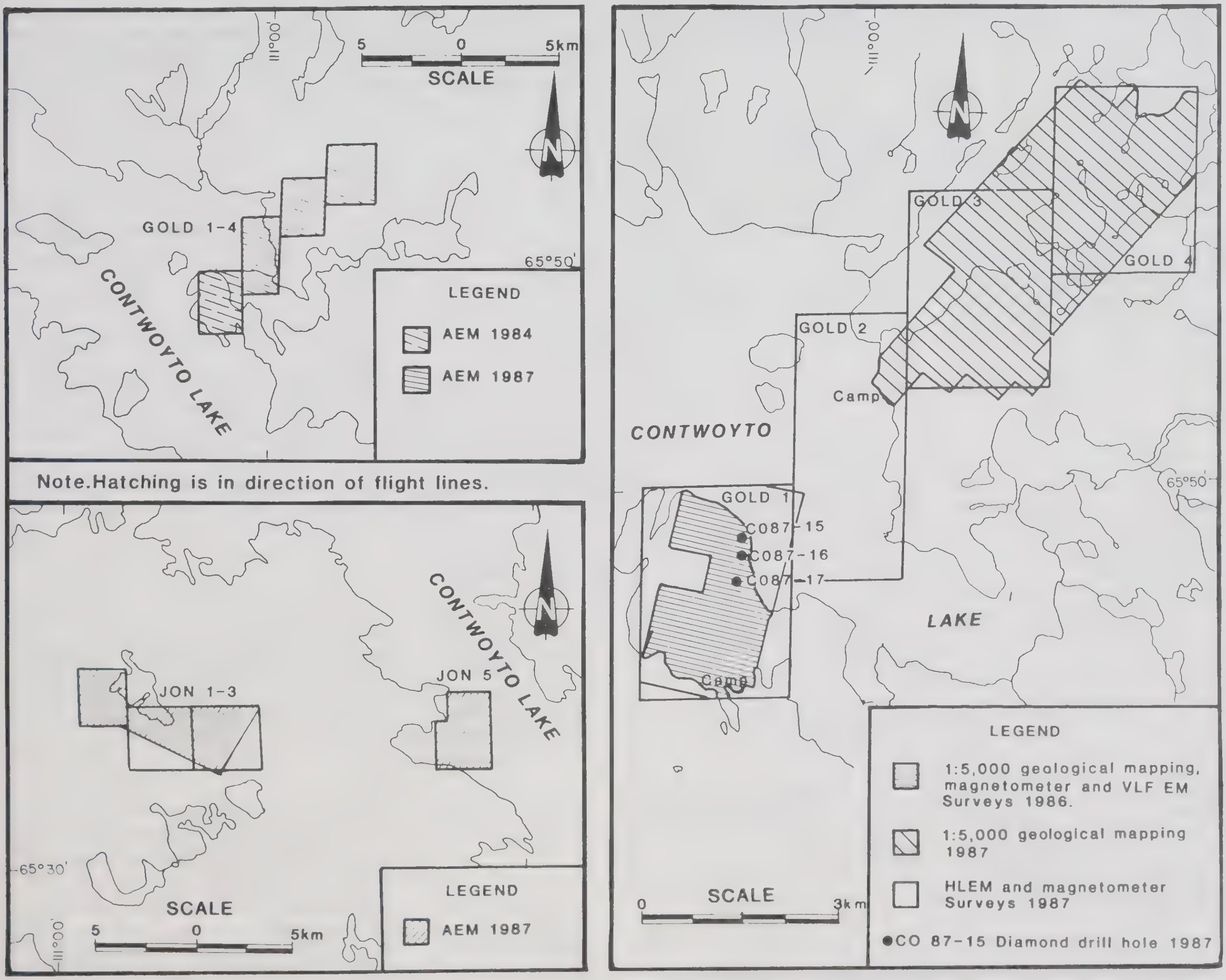


FIGURE 8-32: *GOLD and JON claims. Airborne geophysical survey coverage and grids.*

Areas 1 and 2 are west or on the west shore of Contwoyto Lake and area 3 is on the east side.

HISTORY

JON 1, 2 were recorded in August and JON 3 in December of 1985, GOLD 2-4 in April 1986, JON 5, 6 in September 1986 and JON 7, 8 in July 1987.

Prospecting Permit 33, covering 76 E/10, was mapped in 1963 and 1964 by Canadian Nickel Company Ltd. (assessment reports 017120, 017167).

DESCRIPTION

The only published map of 76 E/10 is in Fraser (1964) at a reconnaissance scale of 1:506 880. The adjoining area to the west is covered by more detailed maps by Bostock (1980) at 1:250 000 and Tremblay (1976) at 1:50 000. The area is mainly underlain by metaturbidites of the Contwoyto Formation of the Archean Yellowknife Supergroup in which the pelitic component has been metamorphosed to cordierite-, andalusite- or staurolite-bearing knotted schists. The Contwoyto Formation contains units of iron formation. Abundant Helikian diabase dykes cut the Archean rocks. Most of Survey area 2 is water covered.

CURRENT WORK AND RESULTS

Helicopter-borne electromagnetic / resistivity / magnetic / VLF EM (DIGHEM) surveys of the three blocks of claims (DIAND assessment report 082516) outlined numerous bedrock conductors and anomalies of possible bedrock origin. Many conductors were coincident with, or flanked by, magnetic anomalies. The presumed target of this work was auriferous iron formations in the Contwoyto Formation.

Diabase dykes give rise to abundant strong northwesterly trending magnetic features.

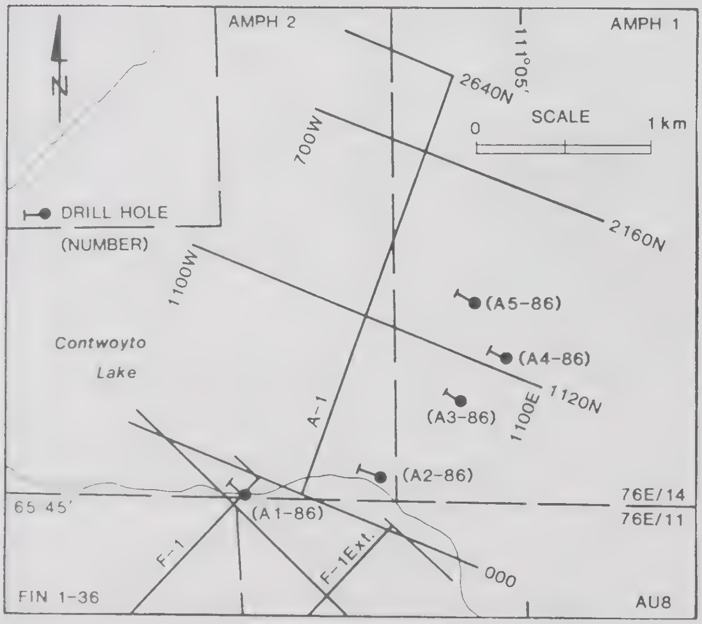


FIGURE 8-33: AMPH 1,2 claims, grids and drill holes.

AMPH CLAIMS

Bow Valley Industries Ltd. | Gold
2020 - 1177 W. Hastings St. | 76 E/11
Vancouver, B.C., V6E 2K3 | 65°46'N, 111°06'W

REFERENCES

Bostock (1980); Fraser (1964); King *et al.* (1988); Tremblay (1976).

DIAND assessment report: 082097.

PROPERTY

AMPH 1, 2.

LOCATION

The claims cover part of Contwoyto Lake (Figs. 8-33, 8-34) and are 390 km northeasterly of Yellowknife. They are centred 6 km east of Lupin Mine.

HISTORY

AMPH 1, 2 recorded in July 1983 were acquired by option by Bow Valley from M. Magrum. Bow Valley explored the southwestern part of the claims by an airborne Input EM and magnetometer survey in 1985.

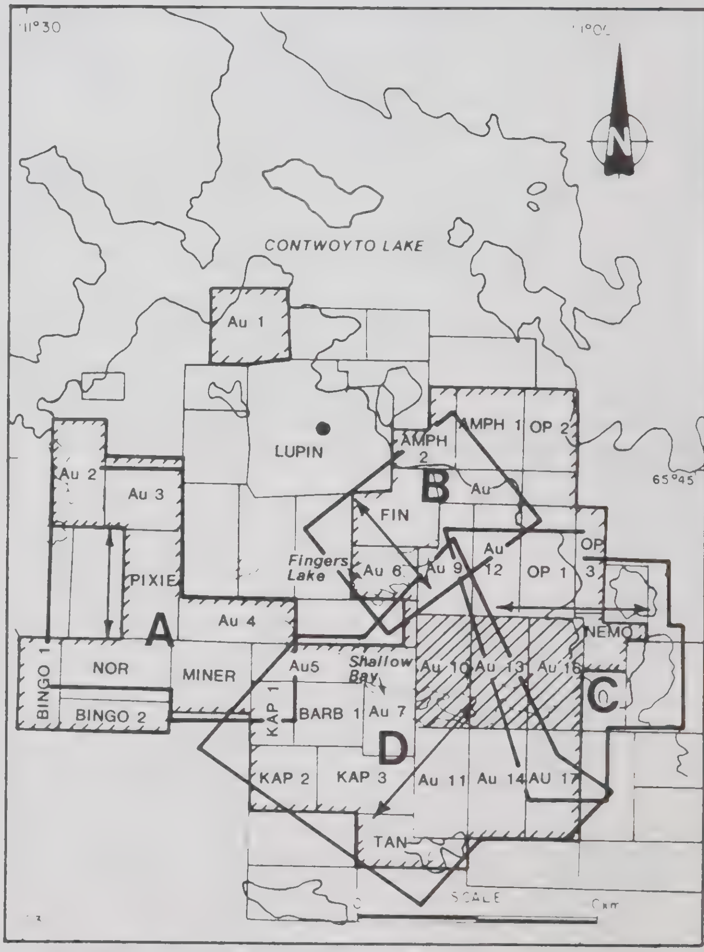


FIGURE 8-34: Bow Valley Industries' claims and optioned property in Contwoyto Lake area, with DIGHEM coverage (from DIAND assessment report 082064).

DESCRIPTION

From the geology of the adjoining southwestern shore of Contwoyto Lake it seems likely that bedrock beneath the Lake would be metasediments of the Contwoyto Formation. The geology of the surrounding area has been mapped at progressively more detailed scales by Fraser (1964), Bostock (1980) and Tremblay (1976). King *et al.* (1988) summarises progress on current mapping.

CURRENT WORK AND RESULTS

A grid (A-1 Grid) was constructed on AMPH 1 and 2 claims (Fig. 8-33) on the ice of Contwoyto Lake and a grid (F-1 Grid) on the adjoining FIN claims was extended north from the shoreline onto the Lake on AMPH 2. HLEM, VLF EM and total field magnetometer surveys were performed on the A-1 Grid, and VLF EM, total field magnetometer and vertical magnetic gradient surveys on the F-1 extension grid. Geophysical targets delineated by these surveys were tested by five diamond drill holes. All holes cut iron formation, some with a high sulphide but low gold content.

The iron formations are enclosed by greenschist-grade turbiditic metasediments which comprise greywacke, siltstone and argillite, and are locally, as in drill hole 4, graphitic. The metasediments, which are on the eastern limb of a syncline mapped by Tremblay (1976) show numerous reversals of stratigraphic tops in the drill core.

AU 10, 13, 16, 27

Bow Valley Industries Ltd. — Gold
2020 - 1177 W. Hastings St. — 76 E/11
Vancouver, B.C., V6E 2K3 — 65°41'N, 111°00'W'

REFERENCES

Bostock (1980); Fraser (1964); King *et al.* (1988); Seaton and Crux (1985); Seaton *et al.* (1987); Tremblay (1976).

DIAND assessment reports: 017167, 081739, 081859, 082064.

PROPERTY

AU 10, 13, 16, 27; NEMO.

LOCATION

The claims are roughly 395 km northeasterly of Yellowknife. They cover most of Shallow Bay of Contwoyto Lake and extend northwesterly to Fingers Lake.

HISTORY

The exploration history of the area is outlined in the several assessment reports cited and summarised in Seaton and Crux (1985) in which additional references are given.

AU 10, 13, 16 and 27 were recorded for Hemisphere Development Corporation in February 1981 and optioned by Bow Valley Industries which explored them as summarised in Seaton and Crux (1985) and Seaton *et al.* (1987).

The NEMO claim was recorded in October 1984 for Bow Valley Industries Ltd.

DESCRIPTION

Greenschist facies metasediments of the Contwoyto Formation, interlayered with three belts of intermediate tuff, underlie much of the claims. There are numerous thin units of iron formation in the metagreywackes and meta-argillites of the Contwoyto Formation. Sediments and tuffs strike west-northwesterly and are cut by several diabase dykes of the Mackenzie Swarm.

Much of the central part of the property is overburden-covered and the NEMO claim is largely covered by the waters of Contwoyto Lake.

CURRENT WORK AND RESULTS

Work, previously unreported, done in 1985 included an airborne Input EM and magnetometer survey, which covered the property as part of a larger area, 128 line-km of grid construction, geological mapping, geophysical surveys and diamond drilling of one 68 m hole. Grids and the drill hole are shown in Figure 8-35.

Grid H4 was explored by geological mapping, Grid H5 by geological mapping, total field magnetometer, vertical magnetic gradient and VLF EM surveys. Grid H7 was geologically mapped. Grid H0 was geologically mapped and explored by total field magnetometer, vertical magnetic gradient and horizontal loop EM surveys. Grid V4 was in part geologically mapped and explored by total field magnetometer, vertical magnetic gradient and VLF EM surveys.

Core from diamond hole H5-85, drilled on the H0 Grid is locally graphitic and pyritic but did not contain gold. Grab samples of iron formation were not auriferous.

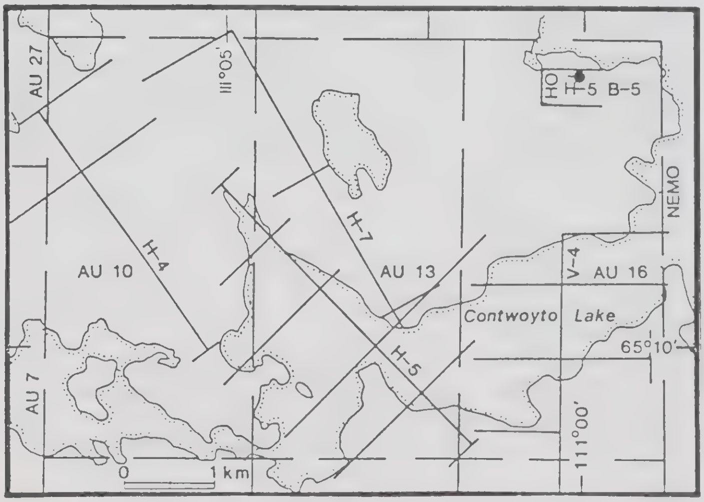


FIGURE 8-35: AU 10, 13, 16 claims and grids.

BINGO CLAIM

Bow Valley Industries Ltd. — Gold
2020 - 1177 W. Hastings St. — 76 E/11
Vancouver, B.C., V6E 2K3 — 65°39'30"N, 111°24'W

REFERENCES

Bostock (1980); Fraser (1964); Tremblay (1976).
DIAND assessment report: 082542.

PROPERTY

BINGO 2.

LOCATION

The BINGO 2 claim (Fig. 8-36) is 285 km northeasterly of Yellowknife and 12 km southwesterly of Fingers Lake, which is connected by 7 km of gravel road to Lupin Mine.

HISTORY

BINGO 1 and 2 claims were recorded in September 1985, to cover several anomalies outlined by a Questor Mark VI input and magnetometer survey.

DESCRIPTION

The area was first geologically mapped in 1963 as part of a 1:506 880 reconnaissance (Fraser, 1964). The Lupin Mine area (76 E/11,14) was mapped at 1:50 000 by Fraser (1964). This area is included in the northeastern corner of the Itchen Lake area map by Bostock (1980).

Tremblay (1976) shows the BINGO 2 claim area to be largely underlain by leucocratic mainly fine-grained quartz-feldspar-biotite gneiss, in part massive coarse-grained red granite, and along its northern boundary, quartzitic fine-grained quartz-feldspar-biotite gneiss. A gabbroic dyke of the Mackenzie Swarm trends northwesterly through the northeastern corner of the claim. There is less than 5% outcrop on BINGO 2.

CURRENT WORK AND RESULTS

Between the 1985 airborne survey and 1987, a small grid was established in the northeastern corner of BINGO 1 and explored by reconnaissance magnetometer and VLF EM surveys.

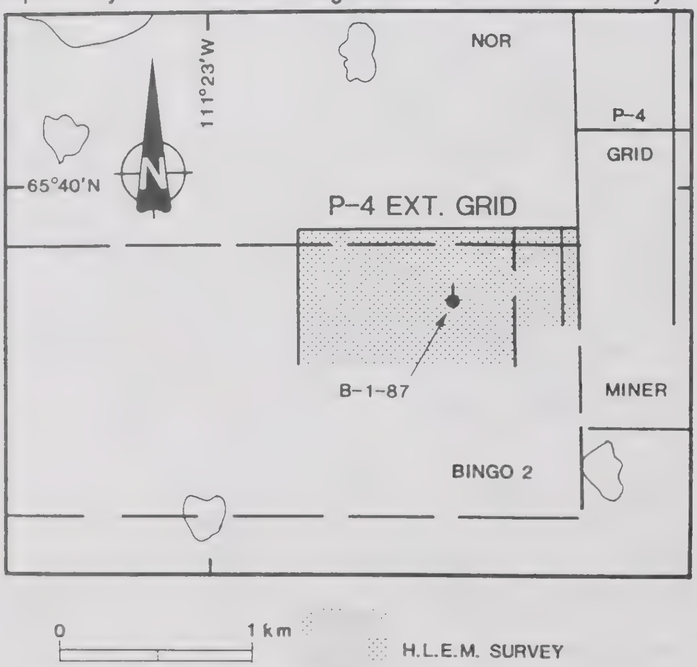


FIGURE 8-36: BINGO 2 claim, grid and geophysical coverage.

In 1987, 11.9 line-km of grid were constructed over the northeastern corner of BINGO 1 claim to cover several AEM anomalies. The grid was explored by total field, magnetic gradient and horizontal loop EM surveys. Four easterly trending conductors were outlined and one in the central part of the grid was tested by an 81 m diamond drill hole.

Drilling intersected metaturbidites (greywacke and cordierite-biotite schists), which are locally graphitic or pyritic.

One EM conductor is attributed to a graphitic cordierite-biotite schist observed both in drill core and outcrop. Graphite may be the cause of the other three conductors. A strong northwesterly trending magnetic feature in the eastern part of the grid is caused by a diabase dyke coincident with a gabbroic or basaltic dyke mapped by Tremblay (1976).

COM CLAIMS

Aurun Mines Ltd.	Gold
P.O. Box 602	76 E/11
Aldergrove, B.C., VOX 1A0	63°36'N, 111°13'W

REFERENCES

Bostock (1980); Fraser (1964); Seaton and Crux (1985); Tremblay (1976).

DIAND assessment reports: 017132, 080690, 082149, 082554.

PROPERTY

COM 1, 2.

LOCATION

The property is 385 km northeasterly of Yellowknife and roughly 19 km south of Lupin Mine (Fig. 8-37).

HISTORY

Gold discoveries in the northern Contwoyto Lake area in 1960 by the Canadian Nickel Company Ltd. resulted in a staking rush in 1961. Work done in the 1960's on ground now staked as COM 1 and an adjoining area to the north and northeast is summarised in Seaton and Crux, 1985, where reference is made to some of the numerous assessment reports detailing work at that time. COM 1, occupies ground held by Roberts Mining company as part of the ROB Group in 1963. The ROB Group was explored by a geological reconnaissance in l963 (DIAND assessment report 017132). Much of the ROB Group was restaked as KAP 2 and 3 in 1983 during a staking rush that followed the 1982 start-up of Lupin Mine.

COM 1, 2 were recorded in November 1983 by B. Weir of Yellowknife. In September 1984 B. Weir optioned the claims to Aurun Mines. Work in 1987 was funded by Equinox Resources Ltd.

DESCRIPTION

Maps covering the area at progressively more detailed scales include: Fraser, 1964 (1:506 880), Bostock, 1980 (1:125 000) and Tremblay, 1976 (1:50 000). The northeastern

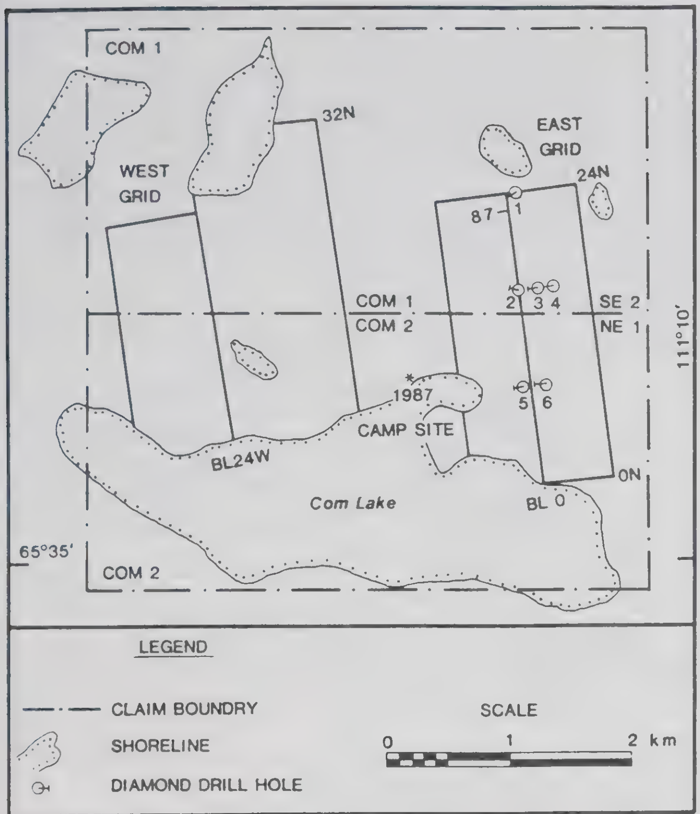


FIGURE 8-37: COM 1 and 2 claims, grids and 1987 diamond drill holes.

part of Bostock's map is adapted from earlier geological mapping by Tremblay. King and others 1988, show the COM 1, 2 area to be underlain by northerly striking intermediate volcaniclastics of the Central volcanic belt and sillimanite-grade metasediments of the Itchen Formation. The volcaniclastics flank the eastern margin of the Olga Tonalite. Tremblay (1976) in Map 1411A has mapped King's Olga Tonalite as various subdivisions of his Unit 1 (leucocratic medium- to fine-grained quartz-feldspar biotite gneiss, in part massive coarse-grained red granite) and the volcaniclastics as layered and massive quartz-feldspar biotite gneiss grading easterly into metasediments.

CURRENT WORK AND RESULTS

Work in 1986 was designed to evaluate EM (Input) conductors and magnetic anomalies discovered during a survey flown over the Central volcanic belt in 1977 at a time when volcanogenic massive sulphide deposits were the primary exploration target (DIAND assessment report 080690). The East and West grids cover separate clusters of Input anomalies.

Exploration in 1986 (DIAND assessment report 082149) comprised geological mapping and prospecting mainly on the East Grid, and geophysical surveys on both East and West grids. Total field and vertical magnetic gradient surveys, VLF EM and self-potential were conducted on both east and west grids; a horizontal loop EM survey was done on the East Grid only. Conductors and flanking, less commonly coincident, magnetic anomalies and self potential anomalies were delineated. As a result of this work, ten diamond drill holes were proposed: seven on the East Grid and three on the West Grid.

In 1987 (DIAND assessment report 082554) a horizontal loop EM survey was performed on the West Grid and six diamond drill holes, ranging in depth from 49 m to 80 m and totalling 397 m, were drilled on the East Grid. Results were disappointing with all core assays less than 0.25 g/t Au, and most under 0.03 g/t Au. EM and SP anomalies outlined in 1986 are evidently caused by graphitic schists and zones which contain pyrite, quartz and lesser amounts of pyrrhotite. Northerly to northwesterly trending diabase dykes are the main cause of the magnetic anomalies. One dyke trends northerly close to the base line of the East Grid.

Cordierite, staurolite, andalusite and garnet were reported from drill core, but not sillimanite. The most common rock intersected in drilling was quartz-feldspar biotite schist.

MINER and NOR Claims

Bow Valley Industries Ltd.	Gold
2020 - 1177 W. Hastings St.	76 E/11
Vancouver, B.C., V6E 2K3	65°40'N, 111°19'W

REFERENCES

Bostock (1980); Fraser (1964); King *et al.* (1988); Seaton and Crux (1985); Seaton *et al.* (1987); Tremblay (1986).

DIAND assessment reports: 017106, 017200, 017203, 017205, 082071.

PROPERTY

MINER; NOR.

LOCATION

The claims are 390 km northeasterly of Yellowknife, 10 km west of Shallow Bay, Contwoyto Lake and 11 km south-southwesterly of Lupin Mine.

HISTORY

The MINER claim was recorded in March 1983 and acquired by Bow Valley Industries in April 1984. The NOR claim was recorded for Bow Valley Industries in October 1984. The history of exploration, which dates back to 1961, is summarised in greater detail in Seaton and Crux (1985) and Seaton *et al.* (1987), who give additional references, and is recorded in the assessment reports cited.

Geological mapping, geophysical surveys and diamond drilling were done on a claim block comprising the AU 4, 5, 7, 11 KAP 1-3, MINER and BARB 1 claims but details of this work are not available.

DESCRIPTION

The MINER and NOR claims (Fig. 8-38) are underlain by Contwoyto Formation metasediments which flank the northern margin of the Wishbone Granodiorite (King *et al.*, 1988). Tremblay (1976) mapped the rocks of this pluton as coarse- and fine-grained red granite. The metasedimentary rocks underlying the claims comprise: quartz-feldspar-biotite gneiss; nodular quartz-biotite schist and gneiss (cordierite-bearing or locally with andalusite or garnet); quartz-biotite schist; and minor iron formation consisting of amphibole and quartz $\pm$ chlorite, $\pm$ garnet $\pm$ biotite $\pm$ pyrite $\pm$ pyrrhotite $\pm$ arsenopyrite. The iron formation is compositionally layered and includes garnetiferous layers, 1-30 cm across.

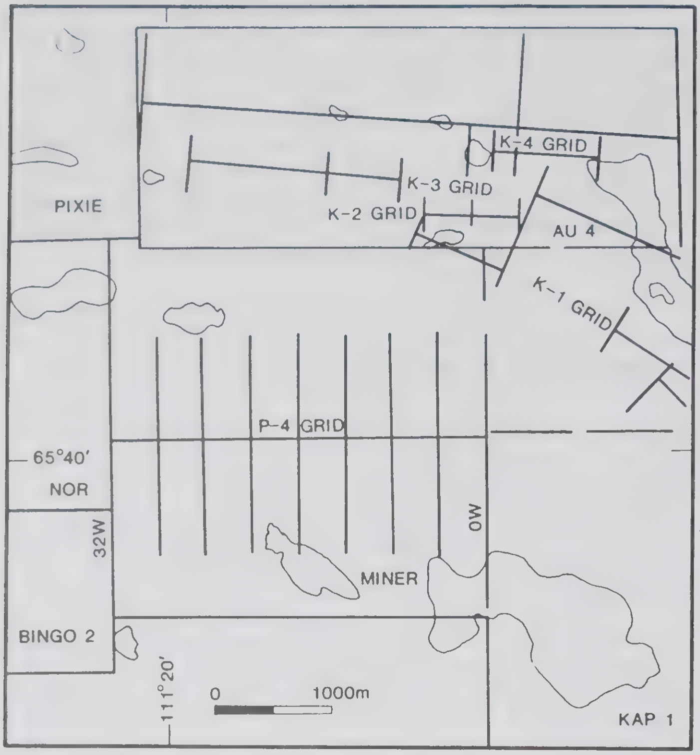


FIGURE 8-38: MINER claim and grid.

The metasediments strike west-northwesterly and are cut by north-northwesterly trending Helikian diabase dykes of the Mackenzie Swarm.

CURRENT WORK AND RESULTS

The P-4 grid of roughly 80 line-km was constructed with an east-trending baseline. The grid covers all of the MINER claim except for its northern and southern marginal areas. Geological mapping, VLF EM, magnetometer and HLEM surveys were completed over the whole grid. Forty-six grab samples, many from iron formation, were assayed for gold. Three samples of iron formation assayed at over 1 ppm Au.

Though several of the VLF EM and HLEM conductors are coincident with iron formation and locally with isolated magnetic highs, a long conductive zone delineated by VLF EM and both 444 Hz and 3555 Hz HLEM, but with no magnetic correlation, is probably related to graphitic beds underlying till.

PIXIE CLAIM

Bow Valley Industries Ltd.	Gold
2020 - 1177 W. Hastings St.	76 E/11
Vancouver, B.C., V6E 2K3	65°42'30"N, 111°21'W

REFERENCES

Bostock (1980); Fraser (1964); King *et al.* (1988); Seaton *et al.* (1987); Tremblay (1976).

DIAND assessment reports: 017161, 017200, 017203, 017205, 017210, 060330, 082047, 082102.

PROPERTY

PIXIE.

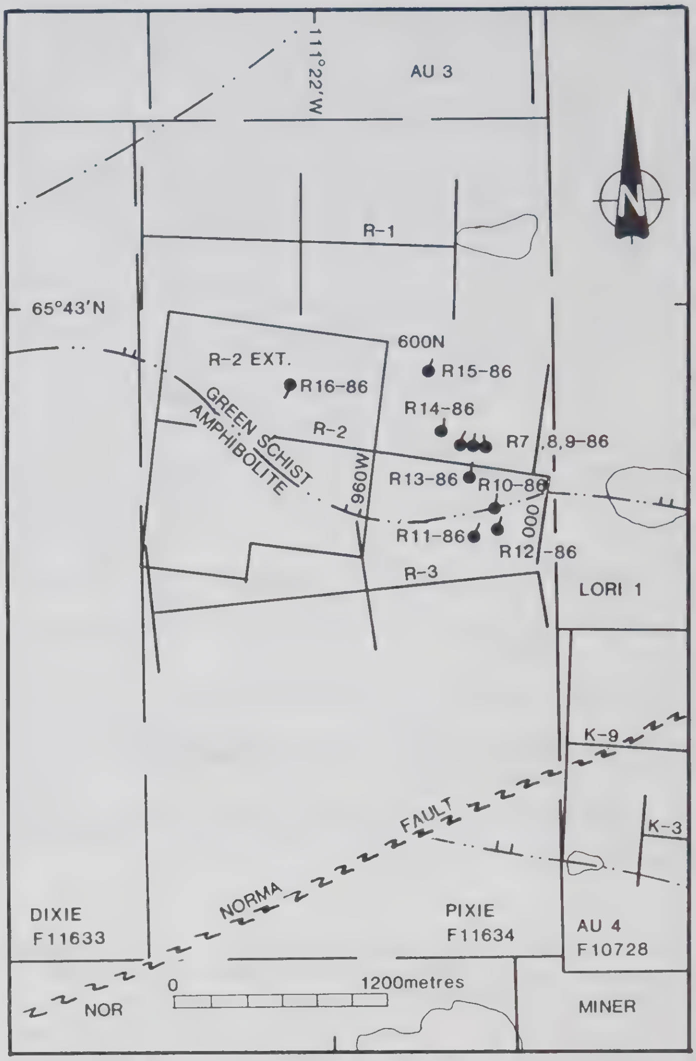


FIGURE 8-39: PIXIE claim, grids and diamond drill holes. Geology from DIAND assessment report 082102.

LOCATION

The claim is 390 km northeasterly of Yellowknife and 10 km southwesterly of Lupin Mine (Fig. 8-39).

HISTORY

The area was explored in the early 1960's as summarised in Seaton *et al.* (1987) and described in DIAND assessment reports 017161, 017200, 017203, 017205 and 017210.

PIXIE was recorded by P. McKay in March 1983 and transferred to Rockridge Mining Corporation in 1984. Bow Valley optioned the claim in 1985, flew an Input EM survey and tested three anomalies detected by the airborne survey by geological mapping, sampling, ground geophysics and diamond drilling (Seaton *et al.*, 1987; DIAND assessment report 082047).

DESCRIPTION

The claim is underlain by metasediments of the Contwoyto Formation which include metaturbidites of greenschist and amphibolite facies. The Norma Fault that trends northeasterly through the southern part of the claim truncates the greenschist-amphibolite boundary (Seaton *et al.*, 1987).

CURRENT WORK AND RESULTS

In 1986 exploration was focused on the R-2 grid in the central part of the PIXIE claim. The grid was extended westward.

VLF EM, HLEM, total field magnetometer and vertical magnetic gradient surveys were performed on the extended R-2 grid.

Ten holes totalling 940 m were drilled on the eastern part of the R-2 grid. Conductive trends correlative with magnetic features proved to be silicate or sulphide iron formation. However only one 0.5 m intersection had encouraging gold content of 3 g/t.

CAR CLAIMS

Echo Bay Mines Ltd.	Gold
354 Granville Sq.	76 E/12; 86 H/9
200 Granville St.	65°39'-65°45'N
Vancouver, B.C., V6C 1S4	111°32'-112°05'W

REFERENCES

Bostock (1980); King *et al.* (1988); Seaton *et al.* (1987).

DIAND assessment reports: 082502, 082503, 082504, 082580.

PROPERTY

CAR 1-15.

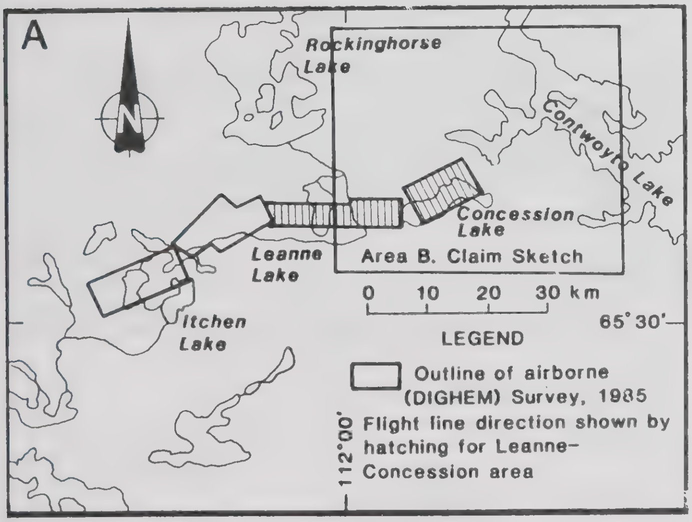
LOCATION

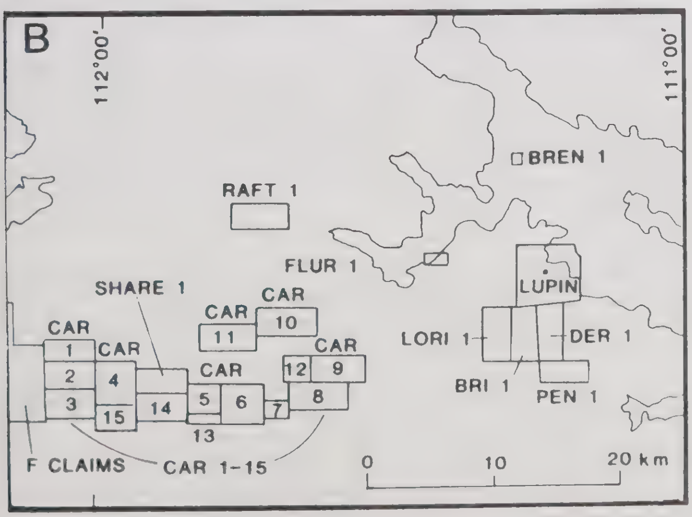
The claims are 375 to 390 km northeasterly of Yellowknife and extend roughly 20 km west of Concession Lake (Fig. 8-40). CAR 1-3 are on 86 H/9. The remaining twelve CAR claims are on 76 E/12. Car 10 and 11 form a discrete group about 2 km north of the main block of CAR claims.

HISTORY

The property covers part of the area explored by Canadian Nickel Company Ltd. from 1962 to 1964 as Prospecting Permit 34, which covered 76 E/12 (Seaton *et al.*, 1987).

The property area was explored by Echo Bay Mines by airborne geophysics (DIGHEM) in July 1985, which covered an area extending from Itchen Lake to Contwoyto Lake. Numerous geophysical anomalies were outlined and a selection of these were investigated on the ground by prospecting, geological mapping and in some cases VLF EM and magnetometer surveys.





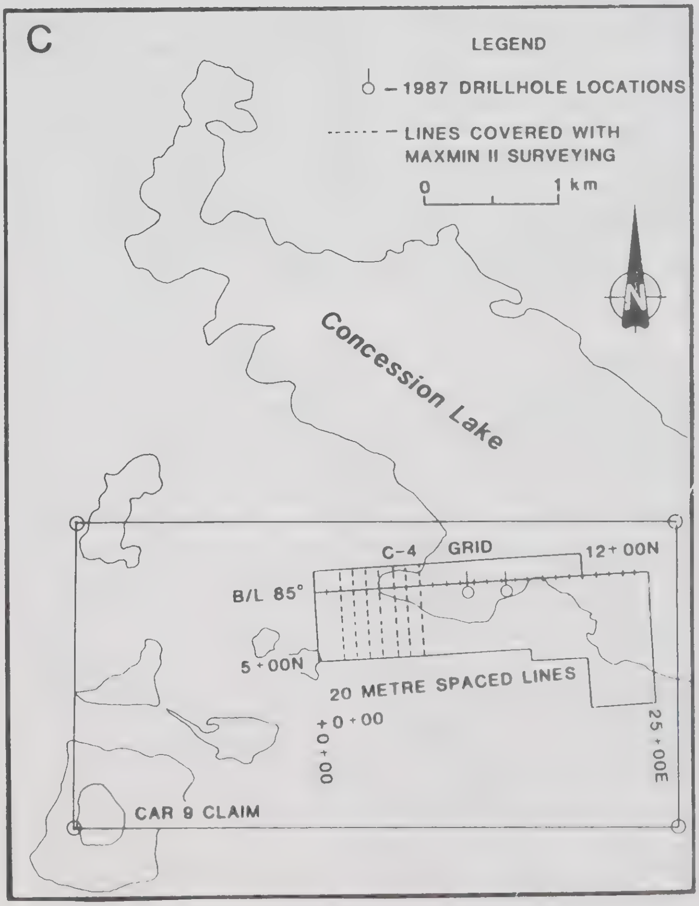


FIGURE 8-40: CAR and other claims; airborne geophysical coverage, ground HLEM coverage and 1987 diamond drill holes on CAR 9 claim.

As a result of this work additional claims were staked including CAR 13-15.

CAR 1-12 were recorded for Echo Bay Mines in July 1985 and CAR 13-15 in November 1985.

Three gold showings were discovered in 1985: one in the southwestern part of the CAR 6 claim, one in the southeastern part of CAR 9 and one in the northwest corner of CAR 7.

DESCRIPTION

The claims cover part of an arcuate belt of metasediments of the Contwoyto Formation, which by definition (Bostock, 1980) contains iron formation lenses. The belt extends from Point Lake, through Itchen Lake to Contwoyto Lake (Fig. 8-40). The iron formation is locally sulphide-bearing and auriferous.

Progress in remapping of the eastern (Contwoyto Lake) part of the area through which the Contwoyto Formation extends is reported in King *et al.* (1988).

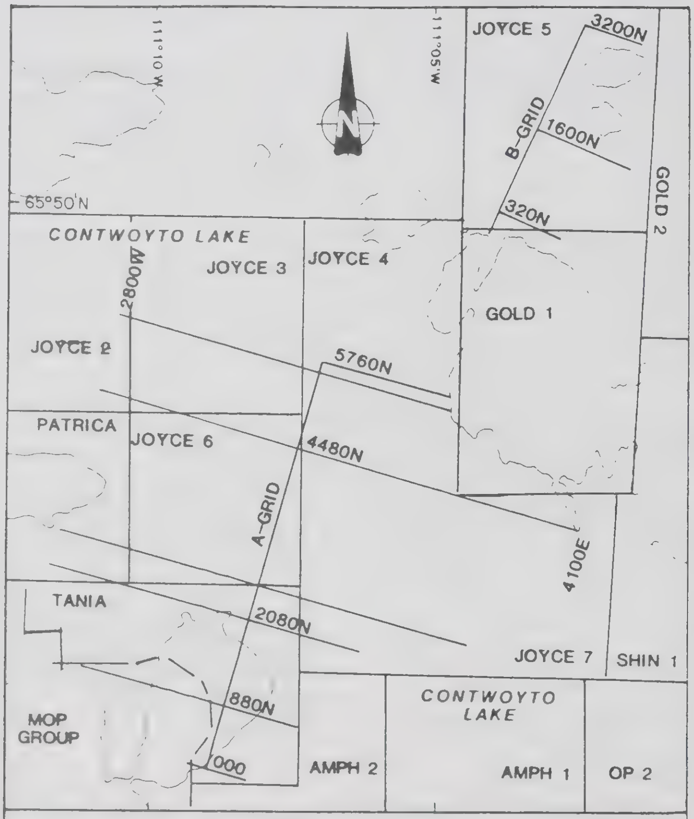
CURRENT WORK AND RESULTS

After compilation of airborne geophysical and ground survey data, numerous targets were selected for investigation in 1986, but of these less than half were examined. The targets selected were auriferous or potentially auriferous iron formation either exposed at surface or indicated by geophysical anomalies. On each of claims CAR 2, 3, 4, 7, 8 and 14 one target was prospected and mapped at 1:15 000. On the CAR 9 claim two gold showings were prospected and mapped at 1:1000. At one of these, the C-4 showing, 0.22 km of additional grid was constructed and 1.5 line-km of magnetometer surveying done. Of 51 samples collected during prospecting, 15 were from CAR 6 claim and 21 from CAR 9, 18 of which were taken from the C-4 gold showing. This showing is a zone of folded but generally easterly striking auriferous iron formation that outcrops near the southwestern shore of Concession Lake.

In 1987 additional grid was constructed on CAR 14 claim at the LE-2 target area which was geologically mapped at 1:15 000 in 1986. Grid construction was followed by prospecting, 1:2000 mapping and a magnetometer survey.

On CAR 5, 6, 13 and 14 claims, targets prospected in 1985 were geologically mapped at 1:15 000 and explored by additional prospecting. In the northeastern corner of CAR 15 the "Canico 26 Grid" was explored by 1:15 000 geological mapping and prospecting. Further work was recommended only at the LE-2 and LE-4 targets on CAR 14.

Much of the 1987 work was focused on the CAR 9 claim at the C-4 airborne geophysical anomaly where ground follow-up included magnetometer and HLEM surveys and diamond drilling. Two holes were drilled totalling 130 m. They cut mainly quartz-biotite (±muscovite) schist. Both holes intersected an amphibolite dyke 2.5 to 10 m wide, but did not cut iron formation. Core was not sampled.



Hole No	Claim	Grid Coordinates	Azimuth	Dip	Depth(m)
J87-1	TANIA	4+00N, 0+80E	285	-45	98.15
J87-2	TANIA	5+60N, 0+35E	285	-45	99.67
J87-3	TANIA	8+80N, 1+00E	285	-45	151.49
J87-4	TANIA	11+20N, 1+65E	285	-45	102.72
J87-5	TANIA	13+60N, 1+90E	285	-45	102.72
J87-6	TANIA	15+20N, 2+25E	285	-45	60.31
					615.06 m

FIGURE 8-41: JOYCE, PATRICIA and TANIA claims and grids.

JOYCE, PATRICIA AND TANIA CLAIMS

Pamorex Minerals Ltd.	Gold
c/o Giant Yellowknife Mines Ltd.	76 E/14
Box 3000, Yellowknife, NWT	66°46'N to 66°50'N
X1A 2M2	111°02'W to 111°14'W

REFERENCES

Bostock (1980); Fraser (1964); King *et al.* (1988); Tremblay (1976).

DIAND assessment report: 082511.

PROPERTY

JOYCE 2-7, PATRICIA, TANIA.

LOCATION

The centre of the property is roughly 405 km northeasterly of Yellowknife, and 3.5 km northeasterly of Lupin Mine (Fig. 8-41). The waters of Contwoyto Lake cover most of the property.

HISTORY

Gold discoveries is 1960, in the northern Contwoyto Lake area, by Canadian Nickel Company Ltd. resulted in a staking rush in 1961. Numerous assessment reports were filed on work done in the 1960's.

A second staking rush commencing in 1982 resulted from the start of mining operations by Echo Bay Mines at Lupin Mine. The PATRICIA and TANIA claims were recorded in June 1985 by W.J. Humphries and the JOYCE claims in October 1985 by G. Sage. The JOYCE, PATRICIA and TANIA claims were transferred to Pamorex in October 1987.

DESCRIPTION

More than half of the PATRICIA and of the TANIA claim is water-covered and only about 5% of the JOYCE claim block is above water (Fig. 8-41). Yellowknife Supergroup metasediments and Archean granitoid rocks outcrop on the southwestern side of Contwoyto Lake. The granitoids were mapped by Tremblay (1976) as biotite-muscovite granite. The same rocks were remapped in part by King *et al.* (1988) and described as biotite granodiorite to syenodiorite. Quartzite and argillite (including concretionary red argillite), lower units of the Aphebian Western River Formation outcrop in the northeastern part of the property on JOYCE 4 and 5 claims. Helikian diabase dykes of the Mackenzie Swarm trend north-northwesterly through the property cutting both Archean and Aphebian rocks.

The Archean sediments have been completely folded during several periods of deformation (King *et al.*, 1988).

The cordierite isograd trends northeasterly from slightly north of Lupin Mine and presumably continues northeasterly under Contwoyto Lake and Proterozoic sediments in the north-eastern corner of the property. Thus granitoids and Archean metasediments of amphibolite facies will mainly underlie the northwestern half of the property, and greenschist facies metasediments will underlie the southeastern half.

CURRENT WORK AND RESULTS

In the spring of 1987 two grids with north-northeasterly base lines (Grids A and B) were constructed, mainly on the ice of Contwoyto Lake. The grids were explored by horizontal loop EM and magnetometer surveys. Fifteen major conductive trends and several minor trends were delineated. Most conductive trends had either coincident or flanking magnetic anomalies. The conductive trends are probably caused by sulphide-bearing iron-formation, which in the southwestern part of the A Grid may be on strike extensions of iron formation at Lupin Mine.

GOLD CLAIMS

Cominco Ltd.	Gold
Suite 700, 409 Granville St.	76 E/14,15
Vancouver, B.C., V6C 1T2	65°51'N, 110°58'W

REFERENCES

Bostock (1980); Fraser (1964); Tremblay (1976).

DIAND assessment reports: 017156, 017147, 082049, 082135, 082516, 082577.

PROPERTY

GOLD 1-4.

LOCATION

The property (Fig. 8-32) is centred 415 km northeasterly of Yellowknife and 15 km northeasterly of Lupin Mine.

HISTORY

GOLD 1, recorded for Hidden Lake Gold Mines Ltd. in March 1983, covers much of the ground held as the ROX 1-54 in the early 1960's by Conwest Exploration Ltd. Conwest optioned these claims to Falconbridge Nickel Mines Ltd., who in 1962 explored them by 1:31 680 geological mapping and by prospecting (DIAND assessment report 017147). The ROX claims subsequently lapsed.

Hidden Lake Gold Mines Ltd. conducted an airborne geophysical (DIGHEM) survey of GOLD 1 in 1984 (DIAND assessment report 082049).

Prospecting Permit 35, which covered NTS 76 E/15 was issued to Canadian Nickel Company Ltd. in 1962 and expired in 1965. Canadian Nickel Company geologically mapped the permit area and explored selected parts by geophysical surveys (DIAND assessment report 017156).

Cominco Ltd. acquired GOLD 1 from Hidden Lake Gold Mines in 1986. In April 1986 Cominco recorded GOLD 2-4, which extend 18 km northeasterly from GOLD 1.

DESCRIPTION

The claims are underlain in order of relative abundance by Archean metasediments of the Contwoyto Formation of the Yellowknife Supergroup, Archean granite, gabbro and Helikian diabase dykes of the northwesterly trending Mackenzie Swarm. Aphebian sediments of the Western River Formation underlie the northwestern corner of the property on GOLD 4. The southeastern part of GOLD 4 is underlain by granite, part of a pluton which lies mainly east and southeast of the property. Dykes and plugs of granite outcrop elsewhere on the property.

The Contwoyto Formation locally contains zones of silicate facies, sulphide facies and garnet-amphibolite iron formation. The Contwoyto Formation metasediments trend northerly to northeasterly.

GOLD 2 claim is largely covered by the waters of Contwoyto Lake.

CURRENT WORK AND RESULTS

In 1986, Cominco explored the GOLD 1 claim by geological mapping and prospecting, magnetometer and VLF EM surveys over a grid with a north-northeasterly baseline. The baseline extends right across the peninsula covered by GOLD 1. Several north-northeasterly trending weakly sulphidic amphibolitic iron formations were delineated which locally are coincident with, or flanked by, magnetic anomalies and conductors outlined by surface and airborne geophysical surveys. The iron formation is locally enriched in sulphides, and auriferous.

In 1987 GOLD 2, 3 and 4 were explored by an airborne (DIGHEM) geophysical survey and geological mapping was done on a grid covering most of GOLD 3 and 4 claims. Iron formations were mapped trending generally north-northeasterly through the grid. They were found to have only low gold content.

Mapping showed the metasediments in the northeastern part of the grid (on GOLD 3 an 4) to be locally cordierite and staurolite bearing in contrast to the greenschist facies sediments on GOLD 1 where these minerals are not found.

Three diamond drill holes totalling 229 m on GOLD 1 (Fig. 8-32) explored conductive zones. Sulphidic iron formation was intersected, but was only weakly auriferous.

CUB, F23, RUSH Claims, PROSPECTING PERMIT 1074

Echo Bay Mines Ltd.	Gold
354 Granville Sq.	86 H/10
200 Granville St.	65°32'-65°45'N
Vancouver, B.C., V6C 1S4	112°30'-112°58'W

REFERENCES

Bau *et al.* (1979); Bostock (1980); Seaton and Hurdle (1978); Seaton *et al.* (1987).

DIAND assessment reports: 080585, 081800, 081865, 081899, 081968, 082050, 082065, 082120, 082153, 082498, 082499, 082500, 082501, 082579, 082581, 082582.

PROPERTY

CUB 1-4; F23; RUSH 1-9; Prospecting Permit 1074.

LOCATION

The claims and prospecting permit are 350 to 380 km north-northeasterly of Yellowknife. They form a single block at or near Itchen Lake (Fig. 8-42).

HISTORY

References to the early exploration history which goes back to 1962, may be found in Seaton *et al.* (1987) and in Seaton and Hurdle (1978).

Most assessment work cited in this report is by Echo Bay Mines. Noranda Exploration Company Ltd. held the southwestern corner of the Prospecting Permit 1074 area as the BOW claims that were staked in 1975 (DIAND assessment report 080585).

Echo Bay Mines recorded F23 in April 1983, CUB 1 in September 1983, RUSH 1 in August 1984, CUB 2 on October 1984, RUSH 2, 3 in August 1985, CUB 4 and RUSH 4, 5 in November 1985 and RUSH 6-9 (staked to secure parts of 86 H/10 NE on release of Prospecting Permit 1074 on January 1, 1987) in July 1986. Prospecting Permit 1074 was granted on February 1, 1985. A 1985 airborne (DIGHEM) geophysical survey over the property outlined numerous anomalies.

DESCRIPTION

The regional geology is shown at 1:250 000 in Bostock (1980). Ban and others (1979) mapped 86 H/10 at 1:31 680. Iron formation in the Contwoyto Formation is locally sulphidic and auriferous and is the target of current exploration.

CURRENT WORK AND RESULTS

Work on the property in 1986 and 1987 included ground follow-up of anomalies outlined by the 1985 airborne geophysical survey (Table 8-6). Follow-up included prospecting, 1:15 000 geological mapping, VLF EM and magnetometer surveys.

On CUB 1-4 in 1986, 30 DIGHEM anomalies were explored by geological mapping and prospecting, and of these, 13 were tested by magnetometer and VLF EM surveys.

In 1987 the IW5 target area on CUB 1 was explored by 1:1000 geological mapping, and four trenches were excavated and sampled. The best trench sample assayed 7.75 g/t Au across 1.35 m. The target was also tested by a magnetometer survey. Three anomalies on CUB 3 were followed-up by

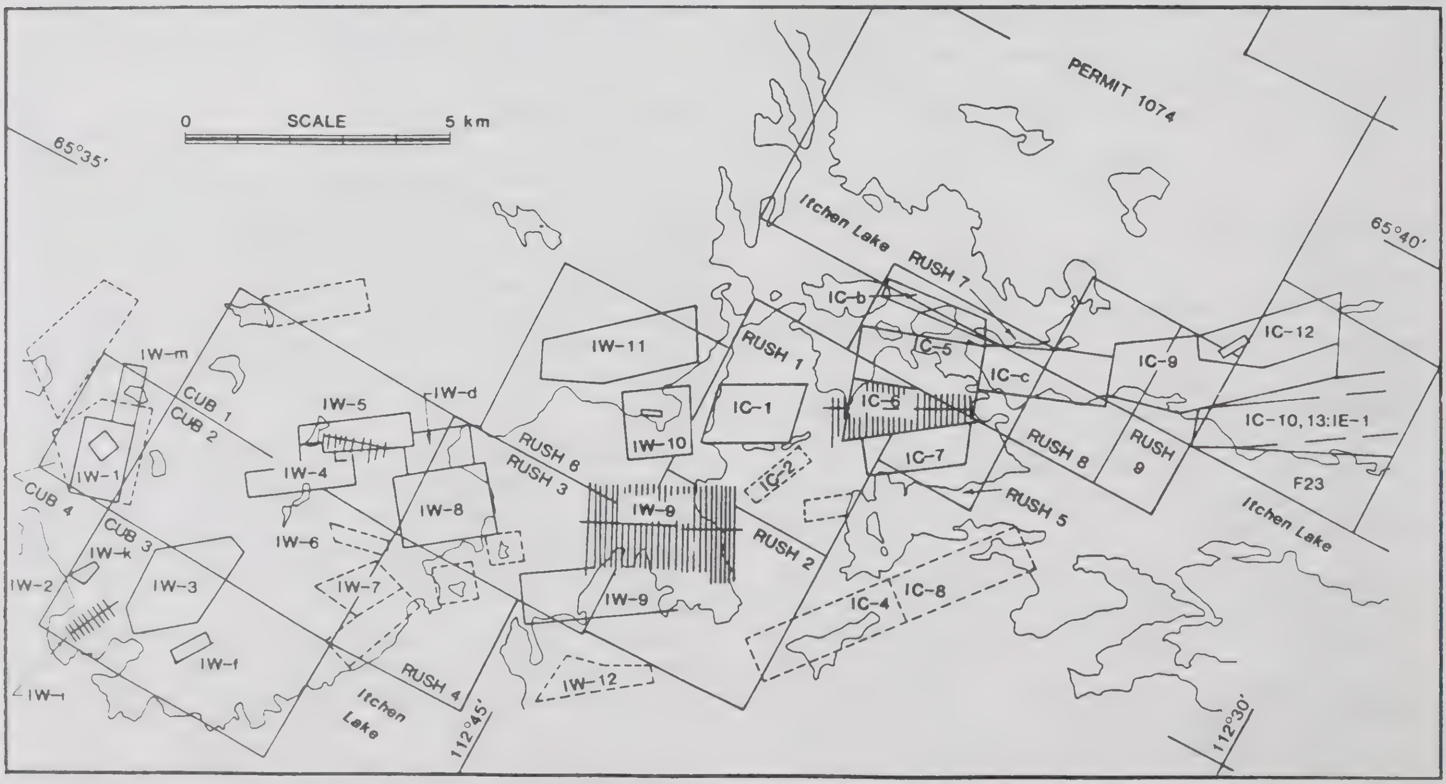


FIGURE 8-42: CUB, F23 and RUSH claims, and Prospecting Permit 1074 grids and anomalies.

TABLE 8-6: SUMMARY OF 1986 AND 1987 WORK ON CUB, F23 AND RUSH CLAIMS AND PROSPECTING PERMIT 1074

CLAIM #	OCCUR. #	DRILLING # HOLES: M.	# SAMPLES	# ANOM.	GRID KM.	MAPPING	MAG KM.	MAXMIN KM.	# TRENCHES	OCCUR. NO.	PROSP. SAMP.	NO. OF ANOM	GRID KM.	MAP SCALE	MAG KM
CUB 4										IW-1	27	1	.4	1:1000	5.0
CUB 3										IW-3/3a	73	0		1:15000	
CUB 2										IW-4	18	0		1. 15000	
CUB 1	IW-5		53	15	19.7	1:1000	19.7	1.82	4	IW-5	46	6		1:15000	
RUSH 3										IW-8	29	1		1:15000	
RUSH 2,3	IW-9	10:733			166.5		166.5	38.8		IW-9	27	0		1:1000	
RUSH 6										IW-10	28	0	.36	1:1000	2.1
RUSH 6										IW-11	5	0		1:15000	
RUSH 3										IW-d	4	-			
CUB 3										IW-f	3	0		1:15000	
CUB 3	IW-k		6	0						IW-k	-	-			
CUB 4										IW-m	7	0		1:15000	
CUB 3	IW-i		6	0											
CUB 3	IW-2		20	1	9.2	1:2000	9.2								
CUB 2	IW-6		10	0											
CUB 2	IW-7		4	0											
OPEN	IW-12		1	0											
RUSH 1										IC-1	27	0		1:15000	SPOT
RUSH 1,7										IC-15	16	0		1:15000	
RUSH 1,5	IC-6		90	0	74.2	1:1000	74.2	4.3		IC-6	18	1		1:1000	
RUSH 5										IC-7	17	0		1. 15000	
RUSH 8,9										IC-9	56	2		1:15000	
F23										IC-10	13 10	0		1:15000	
F23										IC-12	90	1	.52	1:1000	2.32
P.P. 1074										IC-g	13	0		1:15000	
RUSH 8										IC-c	39	1		1:15000	
F23	IC-g		17	0		1:15000				IC-g	-	-			
RUSH 1	IC-2		3	0											
RUSH 1	IC-3		5	0											
OPEN	IC-4		5	0		1:15000									
OPEN	IC-8		3	0		1:15000									
RUSH 1	RUSH	7:480.9													

sampling and prospecting and two of these were surveyed by magnetometer. Only minor amounts of iron formation were found and these had strictly localised gold concentrations.

On Prospecting Permit 1074 one gold showing was found in 1985 as a result of prospecting, sampling, geological mapping, magnetometer and VLF EM surveys of DIGHEM anomalies. Claims were also staked as a result of this work.

Work in 1986 on the F23 claim included prospecting, geological mapping and magnetometer surveys.

On RUSH 1-9, 34 DIGHEM anomalies were investigated on the ground. All 34 were explored by prospecting and 1:15 000 geological mapping. Grids were constructed over four of the anomalies. Detailed (1:1000) mapping and magnetometer surveys were conducted on the grids.

Four gold showings were found in 1986 and six areas were outlined for detailed work in 1987.

In 1987 diamond drilling tested targets on the CUB 1 and RUSH 5 claims.

INDIN LAKE AREA

The Indin Lake supracrustal belt, centred on Indin Lake, is near the western margin of the Slave Structural Province, 200 km north-northwest of Yellowknife. Irregular, generally north-trending belts of Archean Yellowknife Supergroup rocks, dominantly basaltic volcanic rocks, turbiditic greywackes and mudstones (Figs. 8-43, 8-44) of 2669 ± 15 Ma age (Frith and Loveridge, 1982) form the Indin Lake belt. Intervening areas are made up of hybrid rocks derived from both basement granitoid and supracrustal rocks as well as plutonic rocks, generally granite or granodiorite. Metamorphic grade varies from greenschist in the centre of the belt to upper amphibolite facies at the margins. Proterozoic rocks include north-trending diabase dykes, some plutonic rocks and pegmatites (Frith, 1986). The Geological Survey of Canada began mapping the area following the first gold discovery, the Barker vein near the southern end of Indin Lake, in 1938. In 1939 Lord (Lord, 1942)

mapped the west half of the Indin Lake area at 1 inch to 4 mile scale and in 1948 Fortier (Fortier, 1949) mapped at the same scale the east half of the Indin Lake area (Fig. 8-45). Mapping at 1 inch to 1 mile scale in the central part of Indin Lake was carried out at Chalco Lake (86 B/6) by Stanton *et al.* (1954), Ranji Lake (86 B/3) by Tremblay *et al.* (1953) and Ghost Lake (85 O/14) by Wright (1954). During 1972-74 Frith mapped the belt at 1:125 000 (Fig. 8-45; Frith, 1986).

There are many gold showings in the area (Morgan, 1988; Frith, 1986). Gold-bearing veins are typically grey quartz or quartz-carbonate and contain pyrite, pyrrhotite or arsenopyrite. Gold is mostly fine and not readily observed in outcrop. Individual gold-bearing veins, stringers, lenses or stockworks cross-cut Archean Yellowknife Supergroup rocks and related synvolcanic dykes and sills, but are not found cutting Proterozoic diabase. Gold content is generally higher in veins within volcanic strata. Most veins parallel bedding and groups of veins often occupy shear zones such as those developed along the volcanic-sedimentary interface and in the metasediments and metavolcanics near the volcanic-sedimentary contact.

Exploration in the 1940's led to gold discoveries including North Inca, Diversified, Leta Arm, Lex Lake Main zone (formerly the A zone), Spider Lake-Treasure Island and Colomac (Fig. 8-43). Exploration in the 1970's was primarily for volcanogenic base metal massive sulphide deposits; thus, large airborne geophysical surveys were commissioned by Freeport Oil Company Ltd. in 1970 and by Great Plains Development Company of Canada Ltd. in 1971. Subsequently, limited ground follow up, including drilling, located narrow, weakly mineralised argillite and graphitic zones. The tremendous increase in gold price in 1980 prompted renewed interest in gold potential of the area. In late 1984 Echo Bay and partners announced a new discovery, an extension of the Lex Lake property on the KIM claims and in 1985 the Cass discovery (Fig. 8-43).

Colomac is a high-tonnage, low-grade gold deposit. Discovered in 1945, it was explored during 1946-47 by 21 828 m of drilling in 155 holes and by 762 m of drifts and crosscuts to obtain a bulk sample. Auriferous zones are hosted by the Colomac dyke, which is actually a rotated sill, within a series of multiphase diorite to quartz diorite, synvolcanic sills that intrude intermediate and minor felsic volcanic rocks and sediments along the west shore of Baton Lake. A preliminary date for the sill is 2671 ± 10 Ma (Mortensen, 1989, pers comm.). The Colomac sill is a medium-grained, quartz albite porphyry, brittly deformed to produce fracture stockworks and quartz-veined zones that are chloritized, silicified, carbonatized and contain up to 5% pyrrhotite. Gold is in fine fractures and along selvages of quartz veins, rarely within quartz in veins. Thus, gold content is dependent upon fracture density. The Colomac sill is steeply east dipping to near vertical and has a north-trending strike length of 6 km and varies in width along strike from 9 to 60 m, averaging 30 m. Another sill, Goldcrest, 300 m to the west of the Colomac sill, has a strike length of 1000 m and varies in width from 20 to 70 m. Texturally and physically it is similar to the Colomac sill and contains auriferous zones (Fig. 8-46).

Geological reserves of the Colomac deposit have been defined by 1946-47 exploration, a further 20 holes drilled for 2878 m in 1974 by Cominco Ltd., and in 1987, 10 811 m in 138 holes by Neptune Resources Corp. Estimated geologic reserves are 25 Mt grading 1.9 g/t Au. The potential of the sills continues to be explored by drilling.

SPIDER LAKE PROPERTY

International Mahogany Corp.	Gold
P.O. Box 10326, Pacific Centre	86 B/6,11
2470, 609 Granville St.	64°30'N, 115°10'W
Vancouver, B.C., V7Y 1G5	

REFERENCES

Frith (1986); Lord (1942, 1951); Padgham *et al.* (1978); Seaton *et al.* (1985); Stanton *et al.* (1954).

DIAND assessment reports: 017382, 017734, 019699, 062065, 062141, 081680, 081928, 082107, 082604.

PROPERTY

BOOTY 1, DAN 9, 13, 14, 19, EAEC 1, JOHN, KEN 1, LONG, LOOT 1, MIDAS, MIDAS 1-3, PEGLEG 1 and 2, POLLY, RON 1, YAK 1 and 2. The property is under joint venture with Treasure Island Resources Corp.

LOCATION

The claims form a single block at Spider Lake (Fig. 8-44). They are 235 km north-northwest of Yellowknife.

HISTORY

Gold was discovered in the Spider Lake area in 1945. That year the FLY No. 1 and FLY No. 2 groups were staked for Trans-American Mining Corporation Ltd. and the adjacent H.C., LUX, MEX and TEX claim groups for Springer Sturgeon Gold Mines Ltd. Trenching and sampling were performed by both companies in the fall of 1945 (DIAND assessment reports: 017382, 062065). Spinet Mining Company Ltd. acquired the Trans-American and Springer Sturgeon claims in January 1946 and was succeeded by Spinet Gold Mines Ltd. in October 1946. In 1946 and 1947 Spinet Gold Mines explored their property mainly by drilling 5550 m of core on the south shore of Treasure Island. This defined the North, South and East zones, on Treasure Island.

In 1960 the DAN group, on and south of Treasure Island, was staked and an airborne radiometric survey of DAN 9, 10, 13, 15, 19, 20, 23, and DAN X was performed in 1969 (DIAND assessment report 060413). DAN 9, 13, 14, 19 were converted to a mining lease in 1972.

In 1967 Giant Yellowknife Mines Ltd. staked 18 JERRY claims west of Treasure Island on what is now the LONG and PEGLEG claims. Giant Yellowknife Mines mapped and sampled the peninsula east of Treasure Island and an area at the eastern end of Laurie Lake (DIAND assessment report 017734).

In 1970 Seigel Associates Ltd. flew a geophysical survey of the Damoti-Indin-Spider lakes area for Freeport Oil Company (Alberta) Ltd. to delineate volcanogenic massive sulphide targets (DIAND assessment report 060412). Subsequent staking included the PETER claims at the south end of Spider Lake on which one diamond drill hole intersected chalcopyrite and sphalerite in a graphitic argillite, that assayed 0.45% Zn, 0.4% Cu and 2.1 g/t Ag over 4.4 m and 0.5% Zn, 0.06% Cu and 2.4 g/t Ag over 3 m (Padgham *et al.*, 1978; DIAND assessment report 019699).

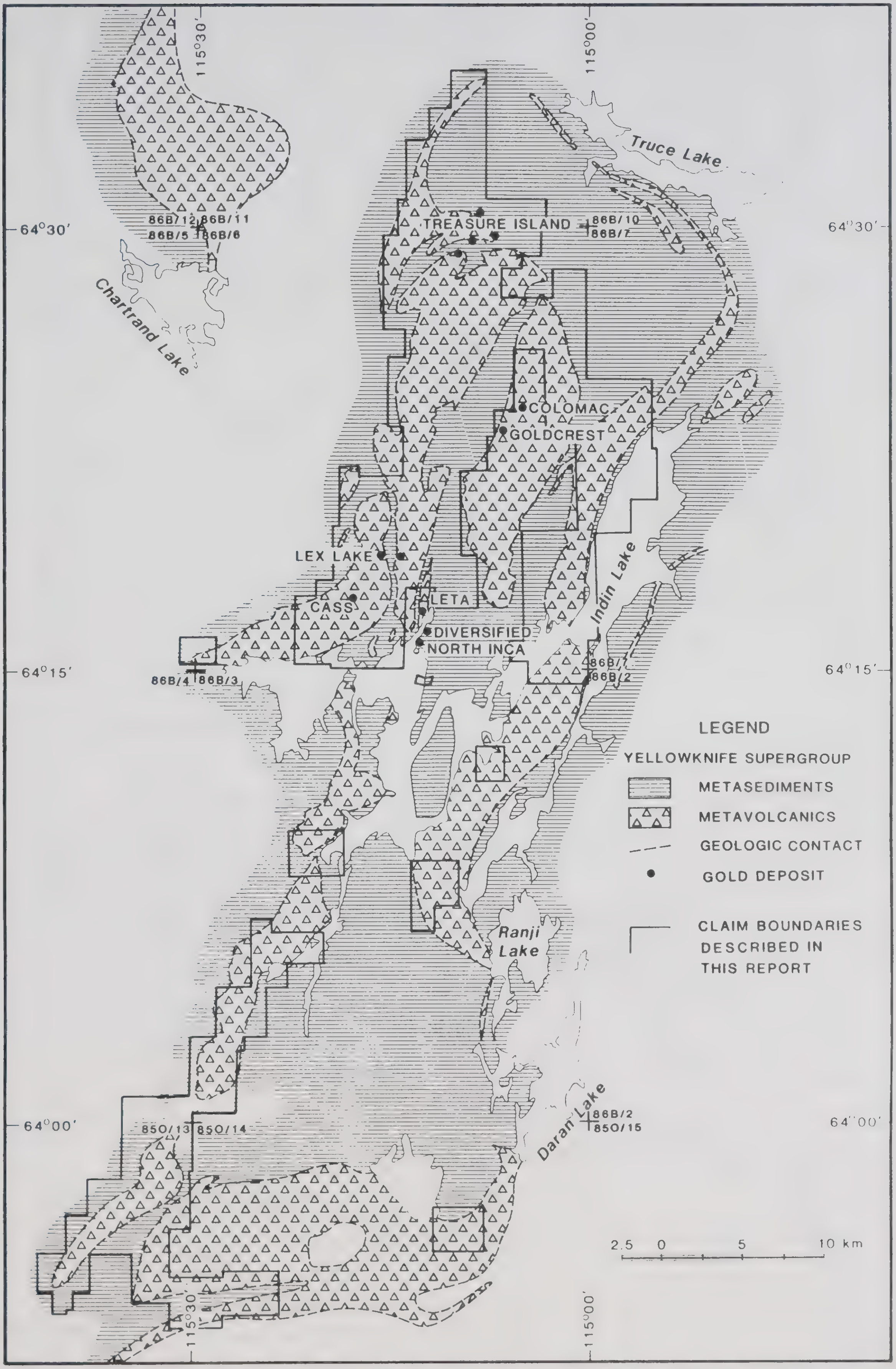


FIGURE 8-43: *Geology, gold deposits and outline of claim boundaries where 1986-87 work is reported in the Indin Lake area.*

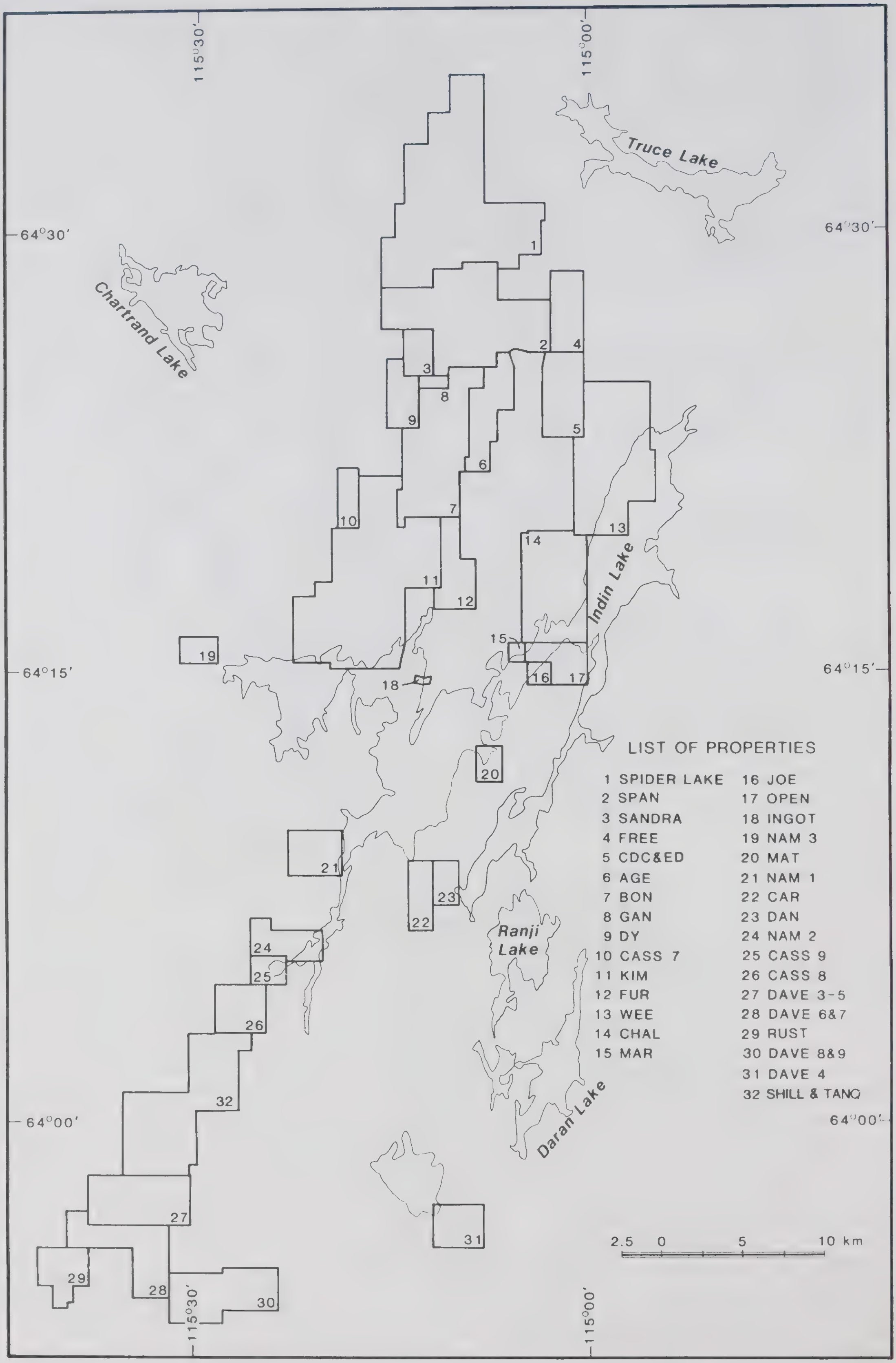
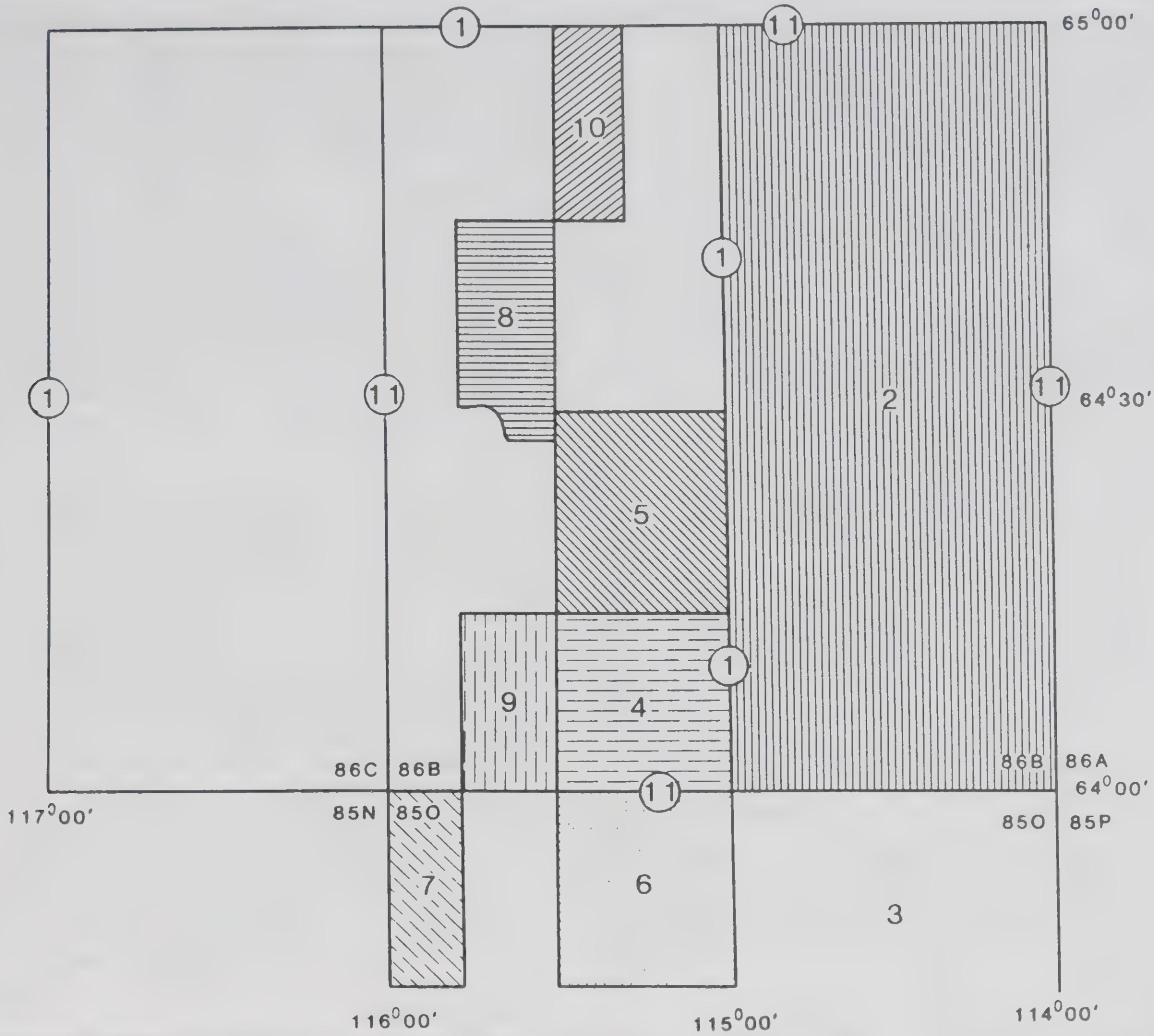


FIGURE 8-44: *Properties in the Indin Lake area where 1986-87 work is reported.*



No[1]	Area (NTS)	Reference	Scale
1[2]	86 B (west half) 86 C (east half) Snare River and Ingray Lake	Lord, C.S. (1942), Snare River and Ingray Lake Map areas, NWT. GSC Memoir 235, Maps 690A, 697A	1:253 440
2[2]	86 B (east half) Indin Lake	Fortier, Y.O. (1949), Indin Lake Map Area (East Half) Northwest Territories. GSC Paper 49-10	1:126 720
3[2]	85 O/15, 16 Wecho River	Yardley, D.H. (1949), Preliminary Map, Wecho River (East Half) NWT. GSC Paper 49-14	1:126 720
4[2]	86 B/3, part 4 Ranji Lake	Tremblay, L.P. et al (1953), Ranji Lake, NWT. GSC Map 1022A	1:63 360
5	86 B/6, part 5 Chalco Lake	Stanton, M.S., et al (1954), Chalco Lake, NWT. GSC Map 1023A	1:63 360
6[2]	85 O/14 Ghost Lake	Wright, G.M. (1954), Ghost Lake, NWT GSC Map 1021A	1:63 360
7	85 O/15 (west half) Basler Lake	McGlynn, J.C. and Ross, J.V., (1962), Geology, Basler Lake, District of Mackenzie. GSC Map 18-1962	1:63 360
8	86 B/12 Arseno Lake	McGlynn, J.C. (1963), Arseno Lake map area, District of Mackenzie. GSC Paper 63-26	1:63 360
9	86 B/4 (part) Mattbury Lake	Smith, P.H. (1963), Geology, Mattbury Lake, District of Mackenzie. GSC Map 44-1963	1:63 360
10	86 B/14 (west half) Mesa Lake	Ross, J.V. (1966), The structure and metamorphism of Mesa Lake map area, District of Mackenzie. GSC Bulletin 124, Map 1173A	1:63 360
11[2]	86 B Indin Lake	Frith, R.A. (1986), Archean geology, Indin Lake map area, District of Mackenzie, Northwest Territories. GSC Open File 1243	1:125 000

[1] Refers to Figure.
[2] Blueline prints of these maps are available from the NWT Geology Division, DIAND, Yellowknife.

FIGURE 8-45: *Geologic maps for the Indin Lake area.*

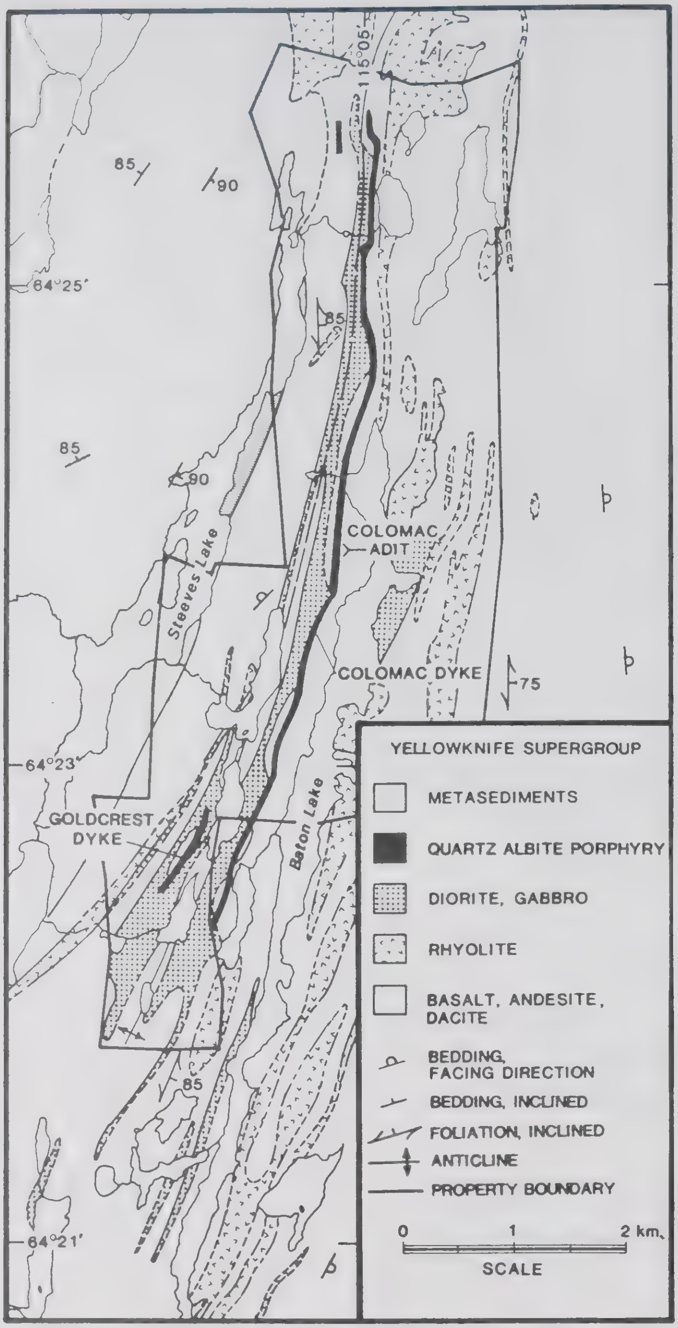


FIGURE 8-46: *Geology of the Colomac area.*

Treasure Island Resources Corp. recorded EAEC 1 in October 1978, BOOTY 1 in December 1979, LOOT 1 in February 1980, PEGLEG 1 and 2 in January 1983, LONG and JOHN in April 1983 and optioned DAN 9, 13, 14, 19 and the YAK 1 and 2 in 1980. During spring 1983 Treasure Island Resources Corp. geologically reconnoitred EAEC 1 (DIAND assessment report 081680) and drilled 8 holes totalling 920 m in the Treasure Island showing area and calculated a reserve of 128 368 t grading 14.1 g/t Au with an additional 37 478 t grading 4.4 g/t Au.

In May 1985 Suncor Inc. optioned the property. Suncor recorded POLLY in April 1985, MIDAS 1-4 in June 1985 and KEN 1 and RON 1 in August 1985. In 1985 exploration by Suncor included extensive prospecting, sampling, geological mapping and VLF EM and magnetometer surveying (DIAND assessment report 081928). In addition an airborne VLF EM and magnetometer geophysical survey was conducted over the area by DIGEM. In 1987 Suncor withdrew from exploration and Treasure Island Resources Corp. optioned the property to International Mahogany Corp.

DESCRIPTION

The Spider Lake property is at the north end of the Indin Lake supracrustal belt (Figs. 8-43, 8-44). The area is underlain by isoclinally folded predominantly mafic metavolcanics and metasediments flanked by granitoid gneiss. Metavolcanics include massive basalt flows, pillowed basalt, and felsic volcanics mapped on JOHN and YAK 1 and the northwestern part of LONG (Stanton *et al.*, 1954). Granitoids underlie parts of LONG and MIDAS 1-4 on the northwestern border of the property.

Metasediments are chiefly greywacke locally porphyroblastic and, close to the volcanic contact, are often interbedded with argillite which is commonly graphitic and pyritic. Metasediments underlie the northern arms of Spider Lake on KEN 1, RON 1, POLLY and PEGLEG 2. A belt of metasediments, less than 2 km wide flanked by metavolcanics, diverges from the main exposure (north and east of Spider Lake) and trends westerly to southwesterly through the southern part of Spider Lake and southwesterly through PEGLEG 1 and LONG. Much of the central (Treasure Island) and western parts of Spider Lake area are underlain by metavolcanics, flanked by metasediments to the southeast and granitoid rocks to the northwest (Fig. 8-47).

The outcrop pattern reflects the complex folding and faulting of the area. The property is along a north-plunging anticlinorium that has refolded earlier generations of folds. Treasure Island is on the nose of an east-trending isoclinal fold that plunges toward the east. In the Laurie Lake area, north-northeast-trending isoclinal folds form the flank of the broad north-plunging antiform.

At least two phases of faulting are recognised. Earlier faults are bedding plane shears preferentially developed along metavolcanic-metasediment contacts. Felsic dykes, silicification, quartz veining and mineralisation were localised along these north-northeast-trending shear zones. Later faults cut these shears at a high angle and are characterised by left-lateral displacement and a northwest strike. Helikian-Aphebian diabase and gabbro dykes were intruded along the northwest faults. Dykes vary from less than 1 m to over 100 m in width, and are vertical.

Regional metamorphic grade varies from upper greenschist to upper amphibolite grade. Regional mapping by Frith (1986) projects the cordierite-staurolite isograds through the southern part of the property immediately south of Treasure Island.

On Treasure Island the main showing consists of a number of steep, stratiform zones parallel to the east-northeast structural trend and 100 to 200 m south of the cordierite-isograd. The contact between turbidites and mafic volcanics is locally intruded by the Gamble dyke, an albite biotite porphyry, trending east-northeast through the southern point of Treasure Island. The dyke is 6 to 12 m wide, dips 75° to 85° north and has been traced along strike for 455 m. Its thermal aureole is characterized by biotite and silification and extends out up to 25 m.

Zones anomalous in gold to the north of the dyke are in volcanics and to the south of the dyke in sediments. Within the sediments numerous quartz veins, ranging from erratic stringers to parallel lenses up to 50 cm wide, locally contain 1 or 2% sulphides, including pyrrhotite, pyrite and lesser chalcopyrite,

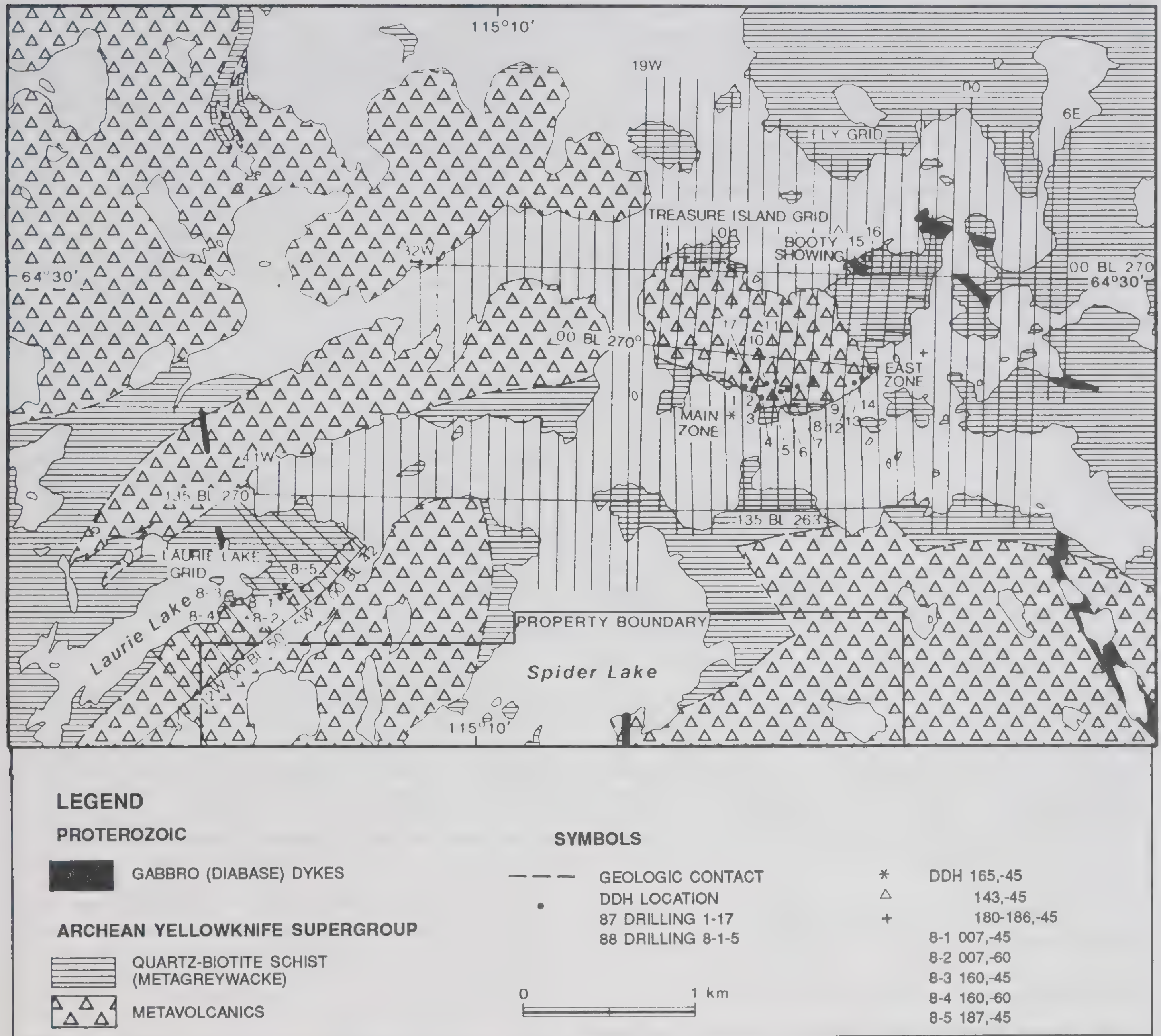


FIGURE 8-47: Geology, main mineralised zones, grids and 1987-88 diamond drill hole locations for the Spider Lake property.

sphalerite and galena. These form numerous gossans, many of which have been trenched. Similarly the metavolcanics are silicified and cross-cut by irregular, narrow (<0.5 cm) quartz-carbonate veinlets locally with sulphides. Zones anomalous in gold are generally recognised only by assaying.

CURRENT WORK AND RESULTS

During March and April 1986 Suncor Inc. had the 79 line-km Fly grid put in on Spider Lake and surrounding areas to encompass the Treasure Island grid and link it to the Laurie Lake grid (Fig. 8-47). The 3.8 km east-trending baseline of the Fly grid crosses the northern part of Treasure Island. VLF and magnetometer surveys covered 71.4 line-km and HLEM 10.5 km. Summer 1986 exploration included: geological mapping, prospecting, trenching, collection of 1206 rock chip samples and 1158 soil samples, line cutting, magnetometer and VLF surveys.

Geologic mapping at 1:500 scale covered: North; Central; and South zones, all of which are east striking, steeply (80°) north dipping; East zone, northeast striking; and Booty showing. Fifteen trenches were blasted in the Main showing and six in the Booty. This work identified a westward extension of the South zone and a parallel striking (084°) New South zone.

Geologic mapping at 1:1000 covered: parts of the Fly grid; Peninsula, Isthmus; RON/MIDAS 2 grids; and the Fly and Point showings both in metasediments on the peninsula immediately east of Treasure Island. Exploration to locate an extension of

the gold showings found on the south shore of Laurie Lake included sampling, prospecting and limited geologic mapping at 1:2500 scale on the south shore of Spider Lake and on the Laurie Lake grid.

Geophysical surveys included 28.75 line-km of VLF on Peninsula, RON/MIDAS 2 and Isthmus grids and 17.9 line-km of magnetometer read on RON/MIDAS 2 and Isthmus grids.

August 1987 to February 1988 exploration consisted of prospecting including sampling 90 showings, excavation of 11 trenches and 3988.4 m of BQ diamond drilling. Twelve holes tested the Main zone, three holes were drilled in the East zone, two in the Booty showing and five holes at the northeast corner of Laurie Lake (PEGLEG 1, Fig. 8-47). 1987-88 drilling confirmed many of the results of previous work and defined five mineralised zones on the south shore of Treasure Island:

1. North zone with a strike length in excess of 45 m and open to the west. Intersections vary from 3.6 g/t Au over 2.1 m to 7.1 g/t Au over 2.3 m.
2. Central zone, at the northern contact of the Gamble dyke, has a strike length of 330 m. Intersections are very erratic varying from 3.2 g/t Au over 1.5 m to 60.6 g/t Au over 0.5 m.
3. South zone, 15 m south of the Gamble dyke, has a strike length of 230 m, is open at depth and dips steeply (83°) north. Intersections vary from 3.3 g/t Au over 0.6 m to 12.6 g/t Au over 1.3 m.
4. New South zone, parallel to the South zone, has a strike length of 230 m and is open at depth. Intersections vary from 3.3 g/t Au over 0.6 m to 5.2 g/t over 1.9 m.
5. East zone, "B" shoot, has a strike length in excess of 100 m and is open to the east. Intersections vary from 1.89 g/t Au over 1.8 m to 21 g/t Au over 1.7 m.

The drilling on the Booty showing resulted in an intersection of 3.87 g/t Au over 0.9 m. Gold content appears to increase to the west, under Spider Lake. At Laurie Lake, all five holes intersected gold and there appear to be at least two parallel mineralised zones. Intersections in these holes varied from 3.4 g/t Au over 0.6 m to 7.2 g/t Au over 1.4 m.

SPAN 1-5 CLAIMS

Echo Bay Mines Ltd.	Gold
354, 200 Granville St.	86 B/6
Vancouver, B.C., V6C 1S4	64°28'N, 115°10'W

REFERENCES

Frith (1986); Lord (1941, 1951); Seaton *et al.* (1985); Stanton *et al.* (1954).

DIAND assessment reports: 017382, 017734, 060413, 062065, 062141, 081980, 082571.

PROPERTY

SPAN 1-5 (4370 ha).

LOCATION

The claims are south of Spider Lake, 230 km north-northwest of Yellowknife (Figs. 8-43, 8-44).

HISTORY

The claims are in an area that has been prospected for gold since the late 1930s. Most activity has been focused immediately north in the Spider Lake area. Claims were held by Spinet Gold Mines Ltd. (FLY claims, 1945), Springer Sturgeon Gold Mines Ltd. (LUX, TEX, MEX and HC claims, 1945), Giant Yellowknife Mines Ltd. (JERRY claims, 1967), J.D. Mason (DAN claims, 1970) and, most recently, Treasure Island Resources Ltd. (DAN, EAEC, BOOTY, LOOT and YAK claims, 1983 to present). Further information on this earlier work can be found in Lord (1941, 1951) and in the various DIAND assessment reports listed under REFERENCES.

The SPAN claims were recorded in December, 1984 and are held jointly by Comaplex Resources International Ltd. and Petromet Resources Ltd. The claims cover trenches exposing silicified and mineralised shear zones cutting metasediments and metavolcanics, the Fortune showing, on the Pop grid (DIAND assessment report 081980). In 1986 the property was explored by Wollex Exploration and in 1987 by Echo Bay Mines Ltd. who returned the property to Comaplex and Petromet in December 1987.

DESCRIPTION

The property is underlain by mafic to intermediate metavolcanics which are locally overlain by felsic pyroclastics. The metavolcanic package is juxtaposed against high and low-grade turbiditic metasediment. The assemblage is intruded by a minor amount of Archean gabbro and quartz-albite rock and is cut by diabase dykes (Stanton *et al.*, 1954).

The structure of the area is complex as shown by the trace of the contact between volcanics and sediments (Fig. 8-48).

CURRENT WORK AND RESULTS

In 1986 Comaplex had the claim block prospected and a magnetometer and soil geochemistry survey over the central part of the Pop grid completed. In 1987 the property was optioned to Echo Bay Mines Ltd. who geologically mapped the claim block at 1:10 000, prospected and collected 214 rock and soil samples for assay. Detailed evaluation of showings on the Pop grid included sluicing, channel sampling, detailed mapping and magnetometer survey. Gold is associated with arsenopyrite, pyrrhotite, and pyrite in structurally complex quartz lenses, ranging up to 4.6 m wide and 12.2 m long, within a carbonitised shear zone that can be traced over a strike length of 140 m. A total of 258 sawed channel samples averaging 1 m in length assayed up to 74 g/t Au. Results from diamond drilling 10 holes for 632 m of core, designed to test the zone at vertical depths of from 53 to 61 m, returned up to 4.8 g/t Au over a core length of 1 m.

SANDRA CLAIM

Frontier Gold Mines Ltd.	Gold
1029 Bel-Air Dr. SW	86 B/6
Calgary, Alta., T2V 2C1	64°26'N, 115°12'W

REFERENCES

Frith (1986); Stanton *et al.* (1954).

DIAND assessment reports: 081886, 082487.

PROPERTY

SANDRA claim (502 ha).

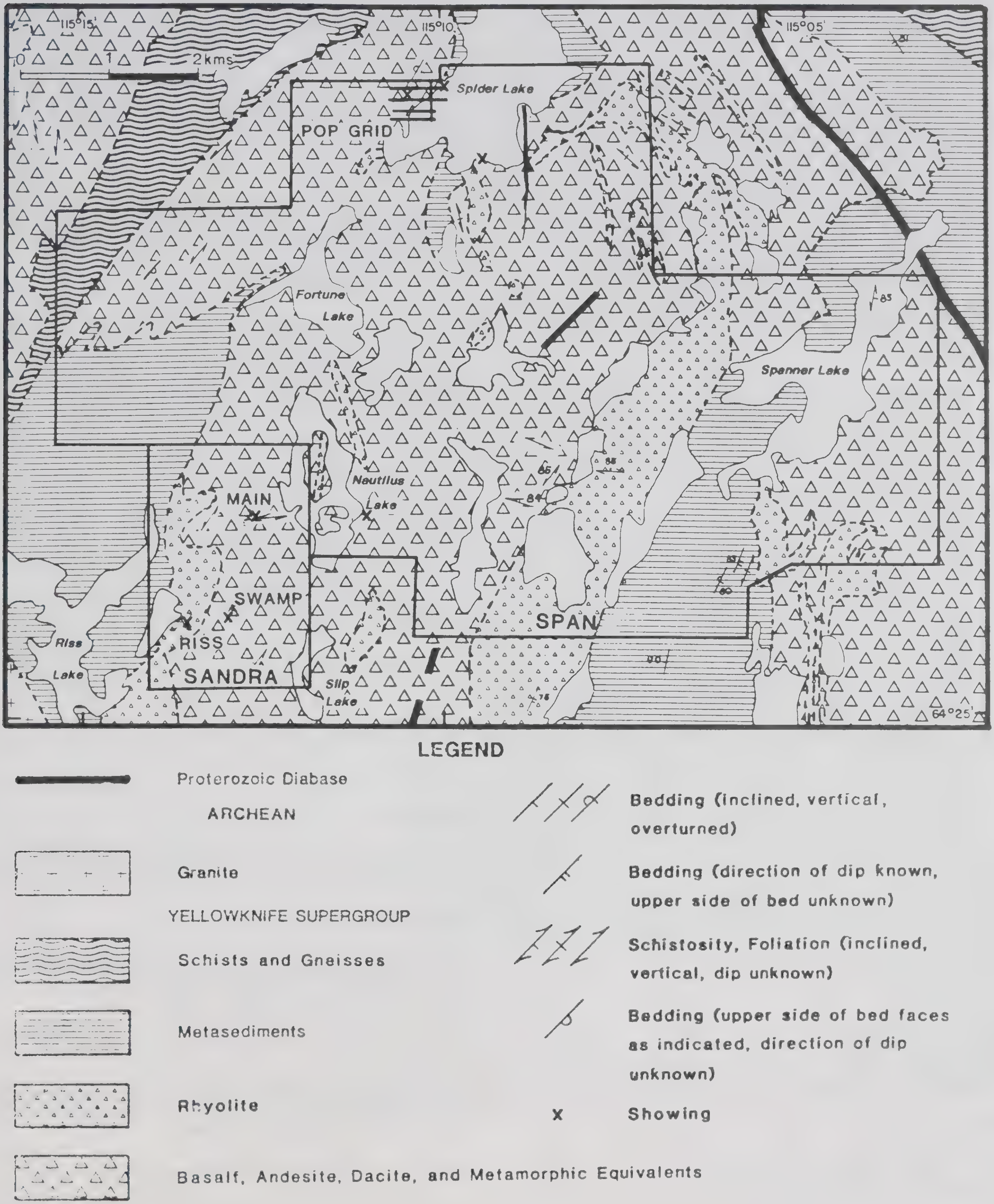


FIGURE 8-48: *Geology and showings on the SPAN and SANDRA claims and the Pop grid.*

LOCATION

The claim is east of Riss Lake, about 225 km north-northwest of Yellowknife (Figs. 8-43, 8-44).

HISTORY

In 1945 Ingray Yellowknife Mines Limited acquired the RISS group at the east side of Riss Lake. Exploration work in 1945-46 by Trans-American Mining Corporation Ltd. found gold-bearing zones on which 762 m of drilling was completed.

In 1976 the ground was restaked as RISS 1-12 and FN 1-12 and trenching was done (DIAND assessment report 081886). SANDRA was recorded in April, 1983 and in August 1985 transferred to Frontier Gold Mines Ltd. In 1985 one day was spent examining and sampling the RISS showing (Fig. 8-48) which consists of quartz and carbonate veins in sheared calcareous andesite (DIAND assessment report 081886). In 1987 Echo Bay Mines explored the property.

DESCRIPTION

The eastern two thirds of the property is underlain by mafic massive and pillowed metavolcanics (Fig. 8-48) fringed to the west by a north-trending slice of felsic pyroclastics and overlain by metasediments (Fig. 8-48; Stanton *et al.*, 1954).

CURRENT WORK AND RESULTS

During prospecting and geologic mapping, 43 trenches in 3 groups were found and 16 samples were collected (Fig. 8-48):

1. The Swamp zone, a northeast-trending shear zone which can be traced for approximately 250 m, consists of a carbonate altered volcanic which hosts fine quartz stringers and veinlets and minor arsenopyrite, pyrite and chalcopyrite. A number of shear controlled quartz veins cross-cut this main shear zone. Seven trenches were cut hydraulically and from these 55 channel, 5 continuous chip and 11 grab samples were collected;
2. The Main zone, 183 m north of and parallel to the Swamp zone, is a series of quartz veins hosted within a northeast-trending shear zone cutting volcanic rocks. Two types of veins are within this zone. The first type is a discontinuous, folded, irregular set of white veins; the second is a more continuous set of shear-parallel smoky quartz veins. Sulphide development is weak and tends to be associated more with the smoky vein set. Both vein sets have anomalous gold assays associated with them. The zone was previously trenched over a strike length of 152 m;
3. Riss Lake showing is a 6 m long quartz pod hosted in metasediments.

GAN CLAIM

Rebus Oil Company	Gold
1842 - 14th St. SW	86 B/6
Calgary, Alta., T2T 3S9	64°25'N, 115°12'W

REFERENCES

Frith (1986); Stanton *et al.* (1954).
DIAND assessment report: 082510.

PROPERTY

GAN

LOCATION

The GAN claim is just north of Turnpike Lake, 230 km north of Yellowknife (Fig. 8-44).

HISTORY

The claim was staked to cover an aeromagnetic high shown on GSC map 2931G and was recorded in August 1983.

DESCRIPTION

The claim area is underlain by andesite of the Yellowknife Supergroup (Figs. 8-43, 8-44; Stanton *et al.*, 1954).

CURRENT WORK AND RESULTS

In 1987 six days were spent cutting a 1.6 km east-trending line, along which magnetometer and VLF EM surveys were conducted and 10 rock and 21 soil samples were collected for gold, silver, copper, lead, zinc and arsenic assay (Fig. 8-49).

DY CLAIM

Aber Resources	Gold
700 - 1177 W. Hastings St.	86 B/6
Vancouver, B.C., V6E 2K3	64°24'N, 115°15'E

REFERENCES

Frith (1986); Stanton *et al.* (1954).
DIAND assessment report: 082585.

PROPERTY

DY 1.

LOCATION

Property is between Schwerdt and Turnpike lakes, approximately 214 km north of Yellowknife (Figs. 8-43, 8-44).

HISTORY

No previous assessment work has been filed for this area; however, there are numerous trenches around Schwerdt Lake. The DY 1 claim was recorded in January 1985.

DESCRIPTION

Yellowknife Supergroup sediments and volcanics, cross-cut by north-trending Proterozoic diabase dykes, underlie the claim area (Fig. 8-49; Stanton *et al.*, 1954).

CURRENT WORK AND RESULTS

In 1987 the contact between the sediments and volcanics was prospected. Trenches around Schwerdt Lake were examined and eight samples of quartz-sulphide vein were collected for gold assay (Fig. 8-49).

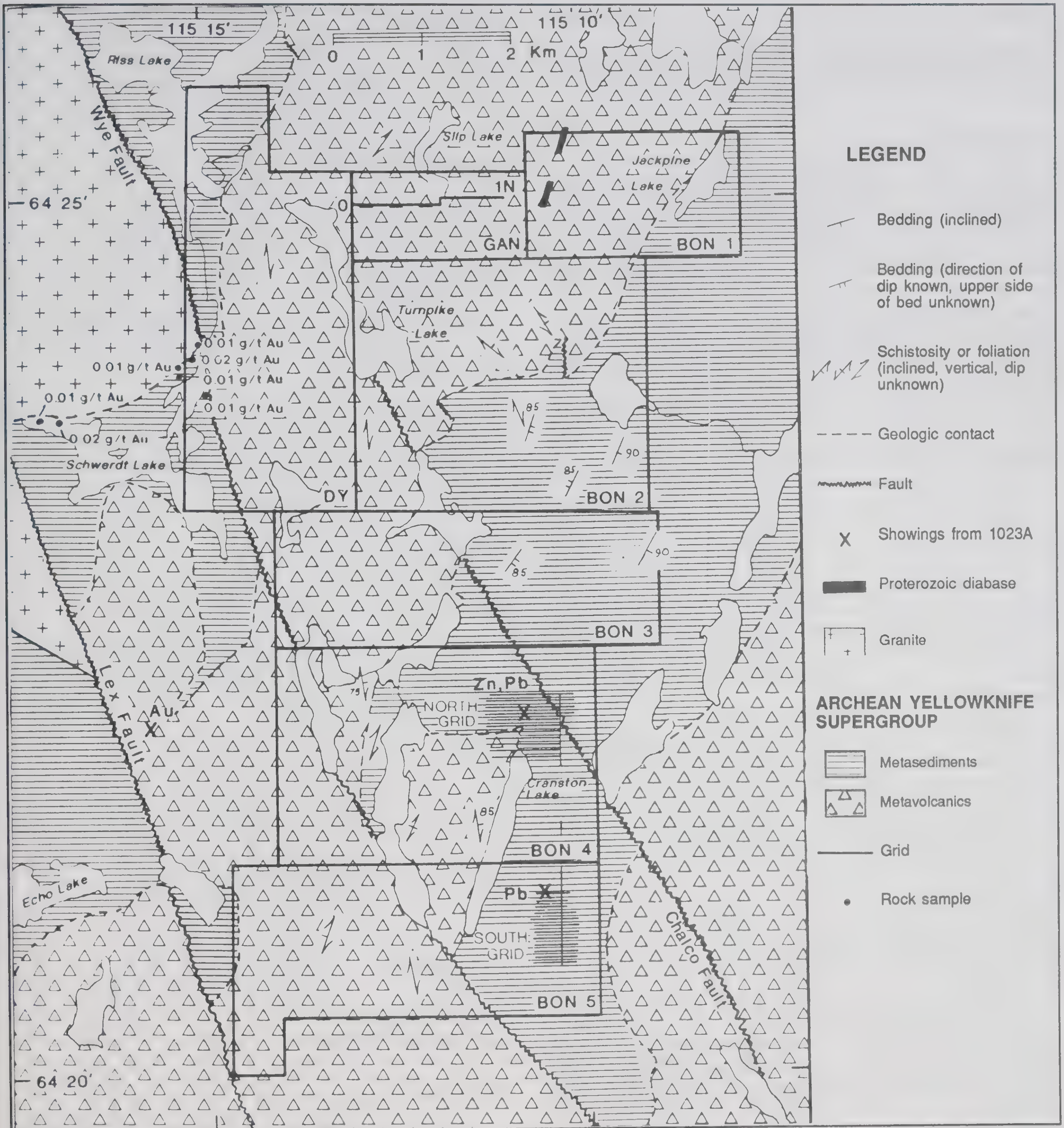


FIGURE 8-49: Geology, grids, showings and samples locations on DY, GAN and BON claims.

BON CLAIMS

Cominco Ltd.
700 - 409 Granville St.
Vancouver, B.C., V6C 1T2

Gold
86 B/6
64°22'N, 115°12'W

REFERENCES

Frith (1986); Stanton *et al.* (1954).
DIAND assessment report: 082056.

PROPERTY

BON 1-5 (3365 ha).

LOCATION

The property is near Indin Lake, approximately 200 km north of Yellowknife, immediately northwest of the KIM property (Figs. 8-43, 8-44).

HISTORY

Previous work indicated by trenches and drill core was not reported. The BON claims were staked for Cominco in June, 1984.

DESCRIPTION

The property covers a 9 km north-northwest-trending segment of the contact between dominantly mafic metavolcanics to the west and overlying metasediments to the east. The contact is displaced along several northwest-trending faults (Fig. 8-49). The metavolcanics comprise basalt, andesite and dacite. Minor rhyolitic flows, tuffs and agglomerates are present especially towards the top of the 1.0 to 1.5 km thick volcanic pile. Overlying metasediments comprise greywacke, slates, arkoses, quartzites and more highly metamorphosed equivalents. Volcanic and sedimentary units have been folded about north-trending axes and bedding is vertical.

CURRENT WORK AND RESULTS

In 1985, two cut grids, North and South (Fig. 8-49) were established to cover areas where there is evidence of earlier trenching and diamond drilling. Magnetometer and VLF EM surveys were completed over the grids. Two hundred and fifty-four B-horizon soil samples were collected, where possible, on the grids at 50 m intervals and analysed for gold and arsenic. The grids were geologically mapped at 1:4000. Exploration of the volcanic-sediment contact to the west and north of the gridded areas included collecting 320 soil samples which were assayed for gold and arsenic.

The North grid is underlain by massive andesite flows and felsic tuffs and greywacke. Some of the felsic volcanic rocks have been altered to sericite schists. Pyrite-rich graphitic beds, sometimes cut by narrow pyritic quartz veins, are interbedded with the greywacke. Fine-grained diabase dykes cut all units. A positive magnetometer anomaly on the North grid corresponds to a swampy zone with sparse outcrops of massive andesites and felsic tuffs. A broad area of low magnetic response in the northeast portion of the grid is underlain by greywacke. The VLF EM survey detected two northerly trending conductors that correspond to pyritic, graphitic units within the greywackes. No gold-arsenic soil geochemical anomalies were delineated on the North grid.

The South grid is underlain by greywackes and impure quartzites. The sediments are cross-cut by narrow quartz veins, which have been trenched. In the southeast portion of the grid where there is no outcrop, there is a moderate magnetic anomaly. Several north-northeasterly trending VLF EM conductors were outlined on the South grid. The most pronounced conductive zone is about 1 km long and corresponds to a topographic depression lacking outcrops. No gold-arsenic geochemical anomalies were delineated on the grid.

Anomalous (> 7 ppm) arsenic in soils was outlined by soil sampling at the south end of Cranston Lake (Fig. 8-49). Arsenic ranges from 10 to 447 ppm in a 1500 m by 400 m zone, and at Jackpine Lake (Fig. 8-49), arsenic ranges from 12 to 50 ppm in a 600 m by 800 m zone.

AGE, FRE, WEE, CAR, OPEN CLAIMS

D. Bryan	Gold
Sub. P.O. No. 1	86 B/6,3
Yellowknife, NWT, X1A 2N1	64°07'-64°28'N
	115°00'-115°12'W

REFERENCES

Frith (1986); Stanton *et al.* (1954); Tremblay *et al.* (1953).
DIAND assessment report: 082561.

PROPERTY

AGE 1, 2; FRE 1, 2; CAR 1 and 3; OPEN 1; WEE 1-5.

LOCATION

The claims are in 5 blocks. CAR and OPEN are south of Indin Lake and AGE, FRE and WEE, north of Indin Lake (Figs. 8-43, 8-44), approximately 210 km north of Yellowknife.

HISTORY

The claims were staked in 1986.

DESCRIPTION

Claims are underlain by north-trending Archean Yellowknife Supergroup volcanics and are flanked by nodular schists and other metamorphosed sediments. Diabase dykes cross-cut the older rocks and trend northwest.

CURRENT WORK AND RESULTS

In 1987, 799 km of magnetometer and resistivity VLF EM survey was flown over 5 separate survey blocks (FRE, AGE, WEE, OPEN 1 and CAR 1). Line spacing was 150 m. (Fig. 8-50). Numerous bedrock conductors and anomalies with flanking or coincident magnetic anomalies were identified.

DAN Claim

J.I. Raines	Gold
Box 6596, Station D	86 B/3
Calgary, Alta., T2P 2E4	64°08'N, 115°11'W

REFERENCES

Frith (1986); Lord (1941); Tremblay *et al.* (1953).
DIAND assessment reports: 081933, 081934, 081935, 082424, 082642.

PROPERTY

DAN 1.

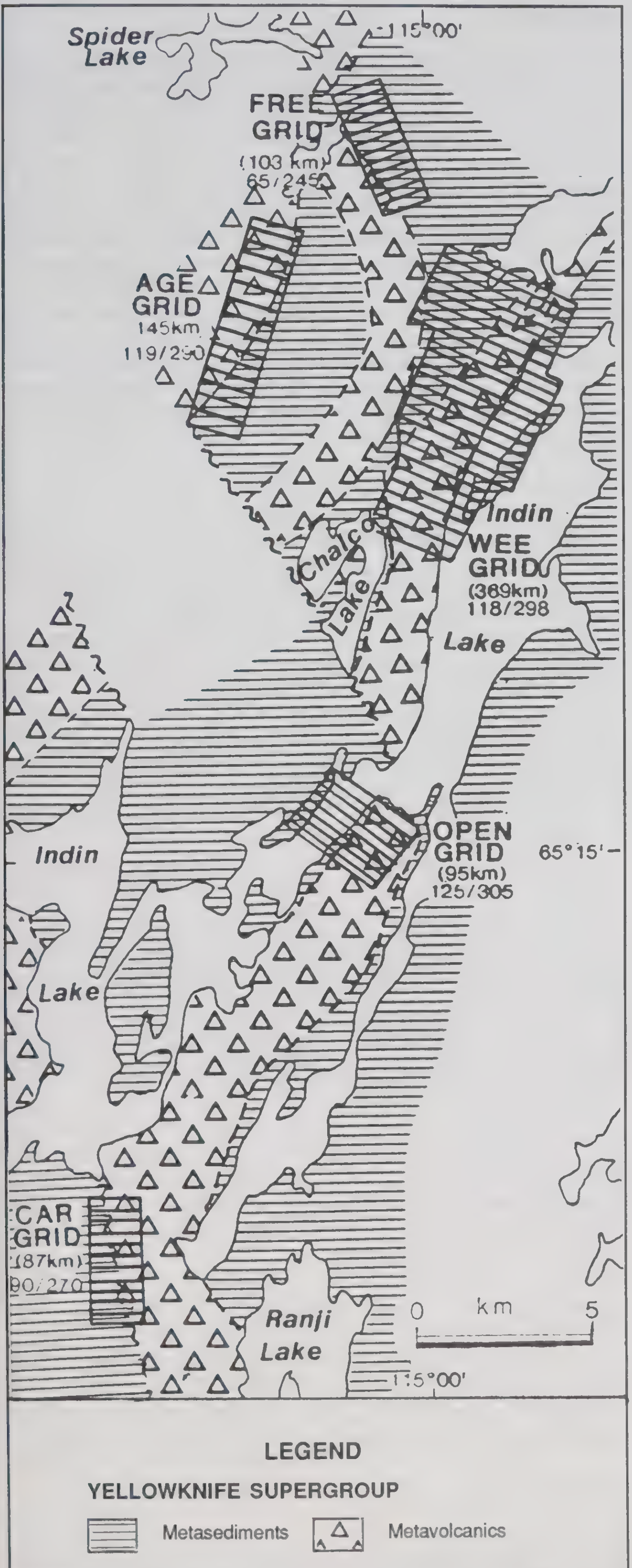


FIGURE 8-50: Airborne geophysical survey areas for AGE, FRE, WEE, CAR and OPEN claims.

LOCATION

The claim is just west of Damoti Lake, 210 km north of Yellowknife (Figs. 8-43, 8-44).

HISTORY

The claim was staked in 1983. Previous work indicated by trenches and drilling on the northwest corner of the claim is not recorded in the assessment files. In 1985 exploration included sampling, geological mapping and a magnetometer survey (DIAND assessment report 081935).

DESCRIPTION

The claim is mainly underlain by hornblende schist, hornblende-feldspar gneiss and amphibolite derived from basalt and andesite of the Archean Yellowknife Supergroup. Several north-trending, steep-dipping felsic volcanic beds were mapped by Tremblay *et al.* (1953) in the north-central part of the claim, and the volcanics are cut by several north-trending diabase dykes. Lord's (1941) map has a gold showing in the mafic metavolcanics east of Gamey Lake in the west-central part of the property; however, additional information on this showing was not found.

CURRENT WORK AND RESULTS

In 1987 a structural geological study using Landsat digital MSS imagery and airphotos was completed to identify lineaments on the property.

ED, CDC and CHAL CLAIMS

Comaplex Resources	Gold
International Ltd.	86 B/06,07
901, 1015 4th St. SW	64°17'N, 115°03'W
Calgary, Alta., T2R 1J4	64°25'N, 115°03'W

REFERENCES

Frith (1986); Stanton *et al.* (1954).
DIAND assessment reports: 082143, 082144, 082532.

PROPERTY

The contiguous ED 1 and CDC 1 claims (1250 ha) are co-owned by Greenstrike Gold Corporation. The CHAL 1-3 group (3130 ha), 7 km to the south, is co-owned by Petromet Resources Limited.

LOCATION

The CHAL group is west of Indin Lake and the ED and CDC claims are east of Baton Lake, about 190 km north-northwest of Yellowknife (Figs. 8-43, 8-44).

HISTORY

The claims were recorded in December, 1984.

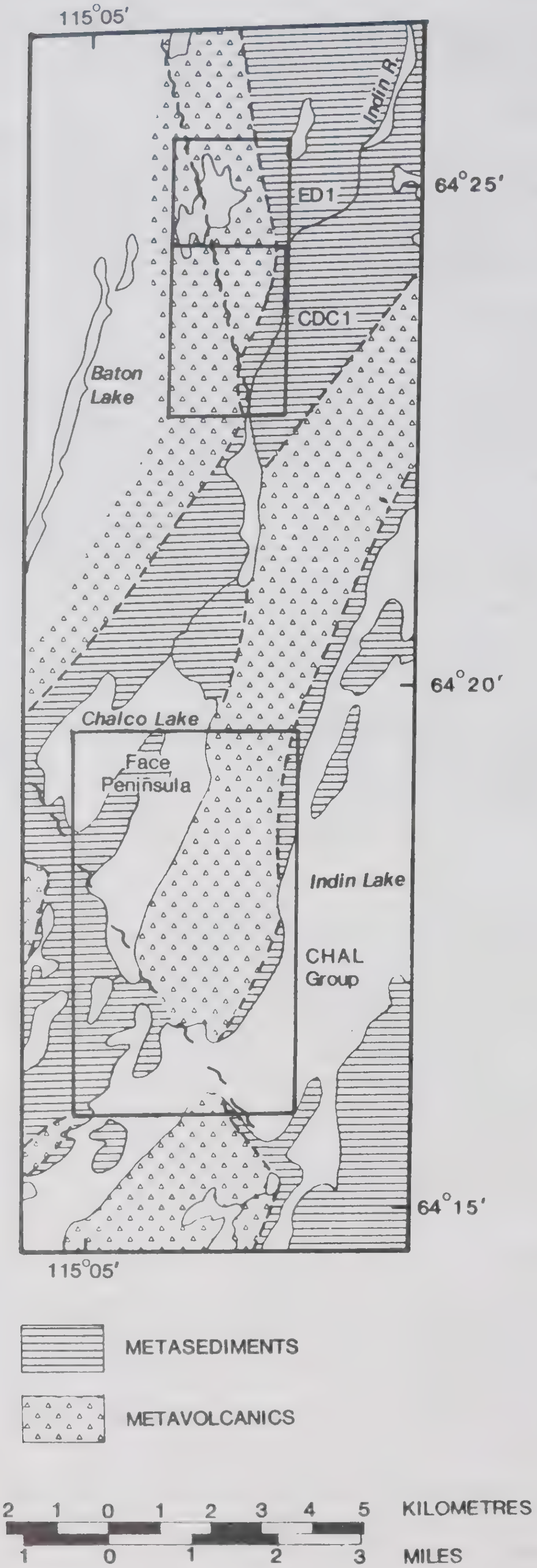


FIGURE 8-51: Geology of ED 1, CDC 1 and CHAL claims.

DESCRIPTION

The claims cover contacts between metavolcanics and metasediments of the Archean Yellowknife Supergroup (Fig. 8-51). Thin basaltic pillowed flows are the most common volcanic and are often carbonate and pyrrhotite rich. Thin units of hard, pink-weathering rhyolite are intercalated with the metabasalts on both claim groups, as are gabbroic sills. Rhyolite beds are also found in the metasediments. The metavolcanics and metasediments are generally north-northeast trending and steep dipping. Fold axes recognised in the metasediments, stretch lineation of pillows and elongation of pyrrhotite streaks all plunge steeply north. On the east margins of the claim groups granitic intrusions have metamorphosed sediments to biotite-hornblende schists and nodular gneisses. Late, northwest-trending sinistral faults and north-trending linear features across which no displacement is noted cross-cut all rock types.

CURRENT WORK AND RESULTS

1985 work is reported here because assessment reports were not filed prior to publication of the 1984-85 Mineral Industry Report. In 1985, a six-person crew spent 20 days mapping, prospecting and rock sampling. On the CHAL claims, a zone of silicification and sulfidisation was mapped along the east shore of Chalco Lake at the contact between metasediments and metabasalts. At the contact quartz veins and stringers carrying pyrite, chalcopyrite and sphalerite were sampled and assayed for gold and silver. Seven of 66 grab samples of sulphide-rich material contained >10 ppb (up to 1270 ppb) Au. On Face Peninsula (Fig. 8-51), sulphide-rich margins were identified along the contacts of a thin rhyolite bed in metasediments. The sulphide margins, up to 3 m thick, comprise pyrite, graphite and minor chalcopyrite, galena and chert. Fifteen of 36 rock chip samples of sulphide-rich material contained >10 ppb Au; the maximum assay was 92 ppb Au.

CDC 1 was mapped and prospected; 79 samples were collected for gold and silver assay. Pyrrhotite-bearing basalt flows are in contact with greywacke along the west side of Indin River. Finely disseminated, euhedral arsenopyrite is associated with pods of blue-grey mottled quartz, quartz-carbonate stringers and vein breccia in the basalt. Gold content ranged up to 3160 ppb.

KIM PROPERTY

Echo Bay Mines Ltd.	Gold
354 Granville Sq.	86 B/6
200 Granville St.	64°18'N, 115°17'W
Vancouver, B.C., V6C 1S4	

REFERENCES

Frith (1986); Lord (1951); Morgan (1988); Seaton *et al.* (1985); Stanton *et al.* (1954).

DIAND assessment reports: 081586, 081698, 081836, 081898, 082061, 082076, 082083, 082100, 082109, 082531.

PROPERTY

Exploration of KIM 1-13 and BAN 1 is a joint venture among Echo Bay Mines Ltd., as operator, Comaplex Resources International Ltd. and Petromet Resources Ltd. BAN 1 was returned to its owner, J. Raines in 1987.

LOCATION

The claim group is centred on Lex Lake, 212 km north-northwest of Yellowknife (Figs. 8-43, 8-44).

HISTORY

The early history of staking in the property area is given by Seaton *et al.* (1985). Much of the 1940's work done on the claims was by Lexindin Gold Mines Ltd. (Lord, 1951) and included drilling the A and C zone showings on Lex Lake.

In 1981 Comaplex Resources International Ltd. recorded KIM 1-9 and sampled existing trenches on KIM 1, 4-6 and 8. Encouraging results were obtained from the A zone on the peninsula on the east side of Lex Lake on KIM 5 (Seaton *et al.*, 1985; DIAND assessment report 081586). In 1982, Petromet Resources Ltd. entered into a joint venture with Comaplex to develop the properties. During winter 1983 magnetometer, VLF EM and Max Min HLEM surveys were conducted over Lex Lake to identify strike extension of the A zone (Seaton *et al.*, 1985; DIAND assessment report 081698).

In 1984, Echo Bay Mines Ltd. joined the Comaplex/Petromet joint venture and drilled four holes totalling 304.2 m along the west shore of Lex Lake in KIM 5 to test an EM conductor and thus discovered the Main zone (DIAND assessment report 081836). As a result, in late 1984, six claims (KIM 1-3, KIM 6-8) were staked and BAN 1, recorded in 1983, was optioned from J. Raines. Prospecting of the new claims found the Cass gold zone in fall 1985, 3 km southwest of Lex Lake. The KIM 9-13 claims were subsequently staked. By the end of 1985, Echo Bay had earned a 75% undivided interest in the claims while Comaplex returned 18.75% and Petromet 6.25%.

DESCRIPTION

The KIM and BAN 1 claims are underlain by Yellowknife Supergroup metavolcanics and metasediments (Fig. 8-52). The metavolcanics form a northeast-trending homoclinal sequence of dominantly pillowed basaltic, andesitic and dacitic flows, intercalated pyroclastics of variable composition, and subvolcanic intrusions. Primary structures such as pillow selvages, vesicules and graded bedding in pyroclastics are preserved. Sedimentary rocks consist of turbiditic greywacke and argillite. Beds vary in thickness from 2 cm to greater than 1 m and primary sedimentary structures are preserved.

Metamorphism ranges from lower greenschist to amphibolite facies within both sedimentary and volcanic rocks. Both the Main zone and Cass zone are in amphibolite-grade volcanic rocks.

The area is structurally complex. Sedimentary rocks are isoclinally folded. Broader folding is recognised within the volcanics. Northwest-trending left-lateral strike-slip faults with near vertical dips, such as the Inca and Lex faults, are the latest and predominant fault direction in the area. These northwest-trending faults are seen displacing an earlier set of north-trending faults such as the Leta fault, which are also believed to have left lateral displacements (Fig. 8-52).

The Main zone on Lex Lake is a stratiform deposit, consisting of quartz-carbonate veins in fractured, sulphide-rich, silicified massive basalt flows, the upper and lower massive basalts, and is 60 m from the volcanic-sedimentary contact. The Main zone has a north trend and dips steeply west. It has been traced for 730 m along strike on the west shore of Lex Lake extending southward where is it displaced 183 m east along the west-northwest Crooked Lake fault. Detailed mapping by Echo Bay Mines has identified the following stratigraphy: a basal sequence of pillowed and massive basalts and irregular gabbroic bodies overlain by: the lower massive basalt; the lower amygdaloidal pillow unit characterised by carbonate amygdules; the upper massive basalt; and the upper amygdaloidal pillow unit characterised by quartz-feldspar amygdules. The volcanic package has been metamorphosed to amphibolite facies, but is in fault contact with a lower greenschist facies package of turbidites. This vertical ductile fault represents a major structural break between the two metamorphic grades. This stratigraphic package can be traced for approximately 900 m with the host basalt units averaging 15 to 20 m in width.

Smoky to white quartz-carbonate vein sets in the Main zone trend northwest and northeast. Veins are folded and show strong ribbon textures along their contacts. Elongate pyrrhotite crystals are oriented along a prominent foliation common in basaltic rocks of the Main zone. Massive and euhedral arsenopyrite is found within and adjacent to quartz-carbonate veins, and in haloes extending 20 to 30 cm from the veins. The arsenopyrite overprints and possibly replaces pyrrhotite grains, and is commonly deformed. Free gold, sometimes visible, is in quartz-carbonate veins, in fractures cutting arsenopyrite crystals, and in sulphide-rich haloes adjacent to veins.

In the Cass zone, 3 km southwest of the Main zone, gold is hosted within a northeast-trending, subvolcanic gabbroic sill, the Cass gabbro, which intrudes a sequence of intermediate to felsic flows and pyroclastics. The gabbro varies in width from 20 to 100 m and has a strike length of approximately 2 km. Two sets of quartz-carbonate veins localise gold, pyrrhotite and arsenopyrite within the host unit. A northwest-trending set of smoky-white, mottled quartz-carbonate veins is dominant. These veins range from a few centimetres to several meters in length and are up to 40 cm in width. Veins are at a high angle to both gabbro contacts and foliation, and are structurally complex. Vein margins are ribboned and the interior structure of the veins is highlighted by folded layers of quartz within recrystallized carbonate. Folds are open to tight, have steep, plunging axes, and axial surfaces are subparallel to the local foliation. The less abundant, northeast-trending vein set is composed of smoky-white quartz, and in contrast with the northwest vein set, is carbonate poor, lies at low angles to the foliation and lacks internal structure.

Pyrrhotite, the dominant sulphide, forms elongated crystals parallel to foliation in haloes 30 to 50 cm in width adjacent to both vein sets. It is also found in massive accumulations along vein contacts. Arsenopyrite occurs in diffuse zones as coarse-grained euhedral crystals adjacent to veins in the silicified metagabbro and as anhedral crystal masses within the veins and along vein contacts. Minor pyrite and chalcopyrite are also present. Gold is concentrated along the contacts of the quartz-carbonate veins, but the sulphide-rich silicified gabbro unit also contains anomalous concentrations of gold.

CURRENT WORK AND RESULTS

In 1986 work included 1:10 000 scale mapping of the property, 1:2500 scale mapping of KIM 5-6 and BAN 1, 1:500 scale mapping of the Main zone and Cass grid, structural studies of the Cass zone, prospecting, rock and soil sampling and geophysical surveys (DIAND assessment reports: 081898,

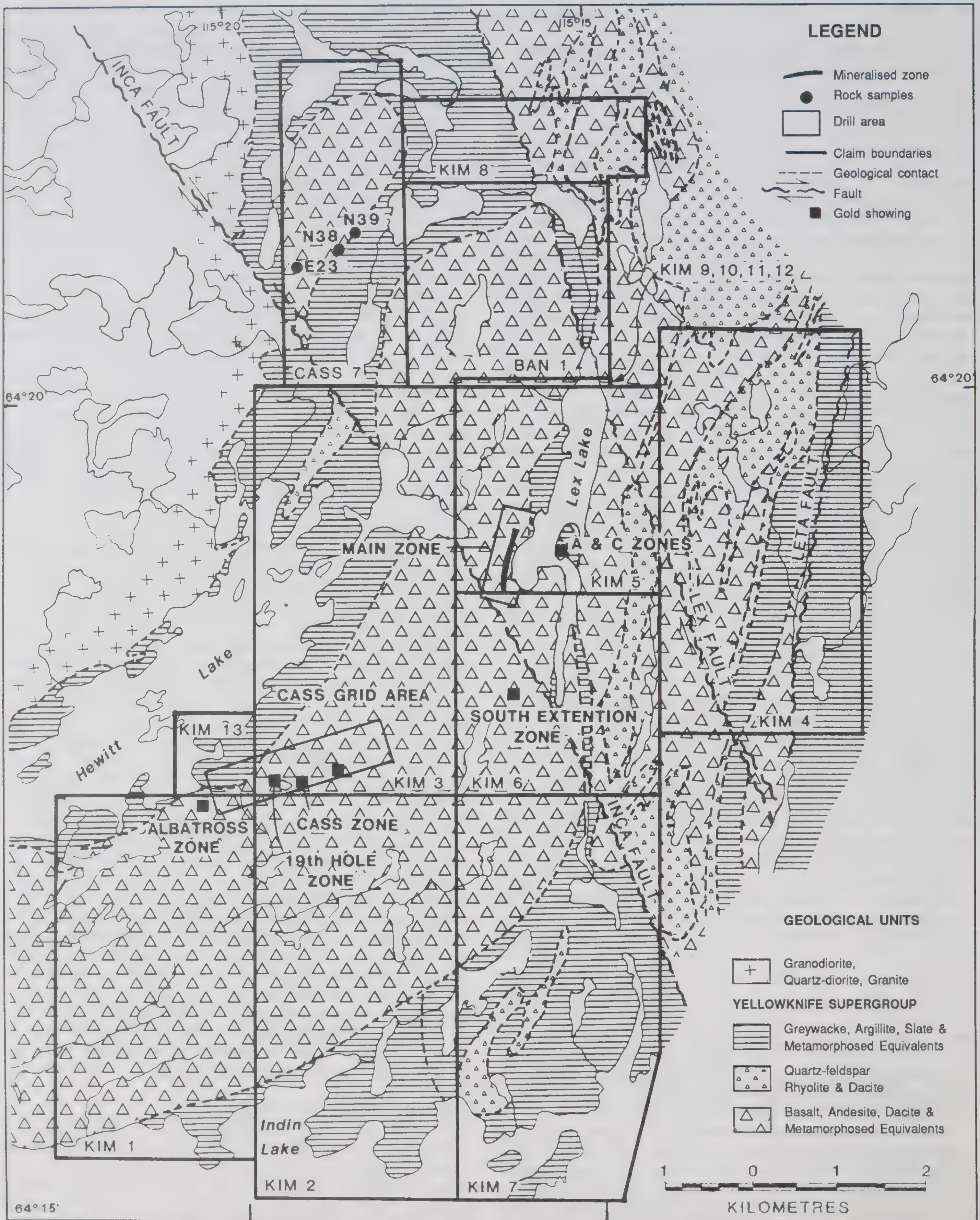


FIGURE 8-52: Geology, grid areas and gold mineralised zones on the KIM claims, CASS 7 claim and BAN 1 claim.

082061, 082076, 082083, 082100). The Albatross and 19th drill hole areas were identified (Fig. 8-52). In 1986-87 Echo Bay completed three drill programs. The first totalling 1941 m in four deep holes on the Main zone (DIAND assessment report 082061) confirmed its extension to a vertical depth of 360 m with grades averaging 7.2 ppm Au across an average width of 4.5 m. The second program of 28 holes totalling 3080 m on the Cass zone confirmed a strike of 360 m (DIAND assessment report 082109). Visible gold was observed in core from 21 of these holes. The width of the Cass zone was found to range from 1 to 15 m, with an average width of 4.9 m.

Exploration continued during November 1986 to March 1987 with the third drill program when 7674 m of NQ core in 44 holes was drilled. Of this total, 241 m were drilled in two holes on the Main zone to determine the attitude of mineralised shoots, three holes on the Albatross, two holes on the 19th drill hole and the remainder in the Cass.

Total drilling to date on the KIM claims is 24 361.7 m; divided between the Main zone and south extension areas, 13 849.7 m; and the Cass and adjacent areas, 10 512 m (Fig. 8-52). Drilling outlined the Main zone over a strike length of 730 m. Faulting has divided the zone into 6 discrete blocks. Probable geologic reserve estimate for one block in an upper central part of the Main zone, 271 m long by 95 m deep, is 112 566 t of 7.98 g/t Au, using a cut-off grade of 4.00 g/t Au and a minimum width of 1.5 m. The Cass has been intersected by drilling over a strike length of 300 m to a vertical depth of 210 m and is open on the southwest half. A probable geologic reserve estimate on a 120 m long by 210 m deep block is 336 292 t grading 7.17 g/t Au. A 3 t bulk surface sample was collected from each of the Main and Cass zones for metallurgical testing and conductivity sorting tests.

FUR CLAIMS

Aber Resources Ltd.	Gold
700, 1177 W. Hastings St.	86 B/6
Vancouver, B.C., V6E 2K3	64°18'N, 115°09'W

REFERENCES

Lord (1951); Stanton *et al.* (1954); Frith (1986).
DIAND assessment reports: 082041, 082586.

PROPERTY

FUR 1 and 2.

LOCATION

The claims are north of Float Lake about 210 km north of Yellowknife (Figs. 8-43, 8-44).

HISTORY

The claim area was staked previously as the ROLEX group by Bidd Consolidated Mines Ltd. in the late 1940s. A 24 m circular mass of white, glassy quartz within Yellowknife Supergroup greywackes and argillites was explored by drilling and excavation of 39 trenches (Lord, 1951).

DESCRIPTION

The claims are entirely underlain by north-trending, tightly folded, interbedded greywacke and argillite cross-cut by Proterozoic diabase dykes (Stanton *et al.*, 1954). North-trending, near vertical shear zones containing auriferous quartz-feldspar-sulphide veins were found between Pistol and Knob lakes on FUR 1.

CURRENT WORK AND RESULTS

In 1987 the shear zones were geologically mapped at 1:1000 along a 3 line-km grid (Fig. 8-53). Nine samples were collected for assay and VLF, magnetometer and gradiometer surveys were completed.

MAR, JOE, MAT CLAIMS

E.P. Meyers	Gold
139 Coleridge Rd. NW	86 B/3,6
Calgary, Alta., T2K 1X5	64°15'N, 115°08'W
	64°12'N, 115°09'W

REFERENCES

Frith (1986); Tremblay *et al.* (1953).
DIAND assessment reports: 060412, 060858, 082119.

PROPERTY

MAR, JOE, MAT.

LOCATION

MAR and JOE are staked over a narrows in Indin Lake and MAT on the north shore of Indin Lake, approximately 210 km north of Yellowknife (Figs. 8-43, 8-44).

HISTORY

In 1970 Seigel & Associates flew an EM and magnetic survey on behalf of Freeport Oil Company Ltd. in search of base metal massive sulphide deposits over the area including the MAR, JOE and MAT claims (DIAND assessment report 060412). This was followed by staking and drilling including 2 holes in the JOE claim (previously the VAN claims, DIAND assessment report 060858; Fig. 8-53). In 1984, E.P. Meyers staked the MAR, JOE and MAT claims.

DESCRIPTION

Mafic through felsic flows are flanked by metasediments including schists and greywacke. Typically at the metavolcanic-metasedimentary contact there are graphitic horizons with disseminated pyrite, pyrrhotite and chalcopyrite.

CURRENT WORK AND RESULTS

1984 and 1985 work is reported here because assessment files were not submitted prior to publication of previous Mineral Industry Reports. In 1984, each claim block was explored by two lines of magnetometer and VLF EM survey. Prospecting included collection of 13 samples for gold assay (Fig. 8-53). In 1985, on the MAR claim, geologic mapping and magnetometer survey were completed over a 425 m by 240 m grid, with 60 m line space and stations every 30 m. Thirty-five samples were collected; assays ranged from trace to 2.8 g/t Au.

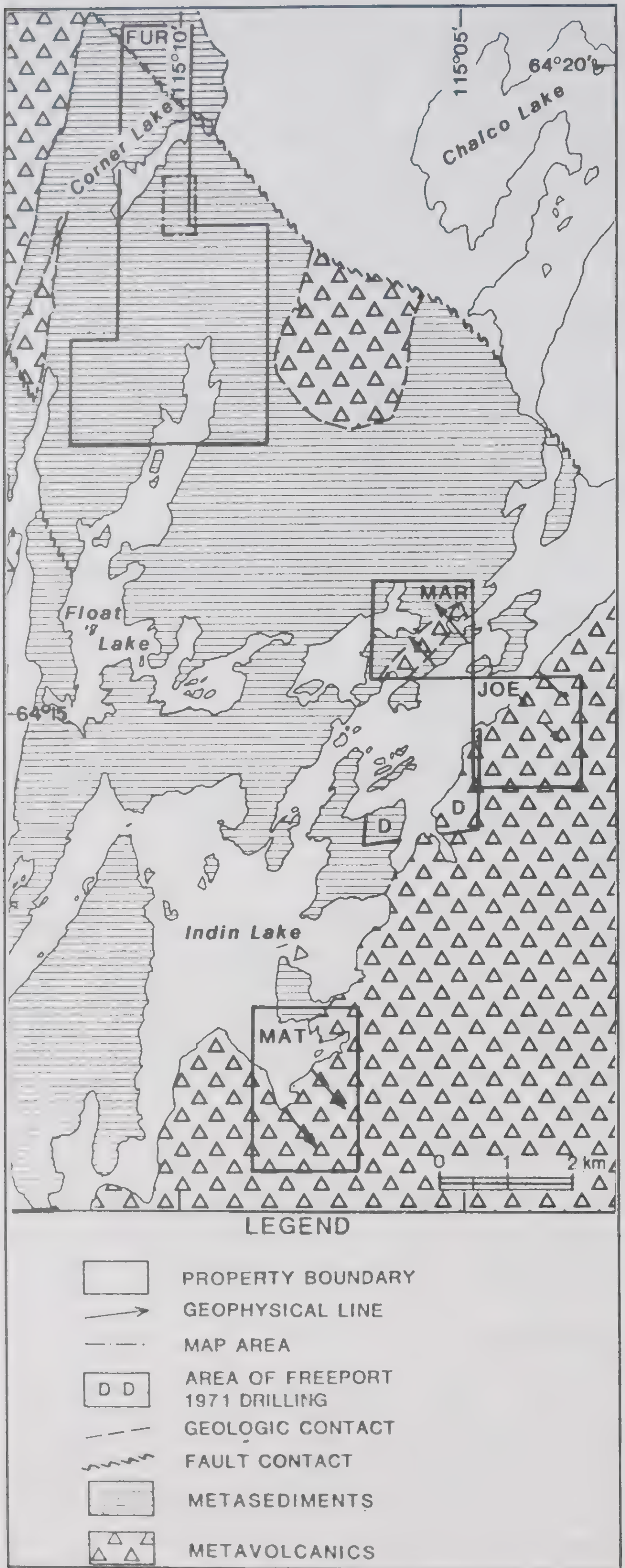


FIGURE 8-53: Geology and property boundaries for FUR, MAR, JOE and MAT claims.

INGOT CLAIM

Mountain Lake Mines Ltd.	Gold
22 Lake Christina Close SE	86 B/03
Calgary, Alta., T2J 2R9	64°14'45"N, 115°12'W

REFERENCES

Frith (1986); Lord (1942), Tremblay *et al.* (1953).
DIAND assessment report: 082178.

PROPERTY

INGOT 1 (69 ha).

LOCATION

The claim is at Indin Lake, about 190 km north-northwest of Yellowknife (Figs. 8-43, 8-44).

HISTORY

INGOT 1 was recorded in March, 1985.

DESCRIPTION

The property covers part of the north-trending contact beneath Indin Lake between Archean Yellowknife Supergroup metabasalts to the west and metasediments to the east (Fig. 8-43).

CURRENT WORK AND RESULTS

In 1986, four chlorite-carbonate-sericite schist samples and one smoky blue-grey quartz sample from a 1 m by 10 cm vein were collected at the northwest corner of the claim. Assay results were 2 ppb Au in the schist samples and 14 ppb Au in the quartz.

NAM and RUST CLAIMS

Stratabound Minerals Corp.	Gold
Suite 518, 222, 58 Ave. SW	86 B/3,5,6; 85 O/13
Calgary, Alta., T2H 2S3	64°09'N, 115°20'W
	64°07'N, 115°23'W
	64°15'N, 115°30'W
	63°55'N, 115°40'W

REFERENCES

Frith (1986); Lord (1942); Tremblay *et al.* (1953).
DIAND assessment reports: 019682, 082514.

PROPERTY

NAM 1-3; RUST 1-3.

LOCATION

These claims are in four separate blocks: NAM 1, NAM 2, NAM 3 and RUST 1-3, 110 to 210 km north-northwest of Yellowknife (Figs. 8-43, 8-44).

HISTORY

The RUST claims cover the area formerly held as the BY and BEAR claims, which were staked to cover airborne EM anomalies identified by Great Plains Development Co.'s 1971 input survey in search of volcanogenic base metals. Follow-up geological and geophysical work in 1972 identified graphitic zones weakly mineralised with pyrrhotite and pyrite (DIAND assessment report 019682).

In 1984 Wollex Exploration prospected and sampled part of the claim area, mapped, completed VLF EM and magnetometer surveys and trenched anomaly 45 from the 1971 input survey, which is on RUST 2. One sample from a zone of disseminated sulphides in felsic tuffs near the volcanic-sediment contact assayed 11.04 g/t Au. The NAM 1-3 and RUST 1 claims were staked in 1985 and RUST 2 and 3 in 1986 by Stratabound in response to interest provided by the announcement of discoveries on Echo Bay's KIM property.

DESCRIPTION

NAM 3 is at the western termination of an easterly trending volcanic belt that swings to the north in the vicinity of the Cass and Lex Lake gold properties. NAM 1-2 and RUST claims are along a northeasterly trending volcanic belt that forms the west limb of the Spider Lake synclinorium (Frith, 1986). Basalts are the most abundant volcanic rocks and consist of pillowed and massive flows, fragmentals and metagabbro, which, with the increasing effects of deformation and metamorphism, grade into garnet-amphibolite schists and gneisses. Minor felsic volcanics comprise massive and fragmental rhyolite and dacite and typically are at or near the contact with sedimentary rocks, but are also intercalated with basalts.

Greywacke is the most abundant sedimentary rock and consists of nodular schist containing porphyroblasts of cordierite, andalusite, staurolite, garnet or sillimanite. Argillaceous rocks are near the contact with the volcanics and are graphitic, sheared and locally contain pyrite and pyrrhotite. There are numerous gossans up to 60 m long at the volcanic-sediment contact.

Granite and pegmatite sills and dykes have intruded the supracrustal sequence covered by the NAM 3 claim. Diabase dykes cut all rock types and are on all the claims.

CURRENT WORK AND RESULTS

In 1986, prospecting, geological mapping and collection of 374 samples for assay were completed. Forty samples had anomalous gold assays (>10 ppb). In 1987, prospecting, mapping, line cutting, trenching, chip sampling and saw cut channel sampling were completed. Anomalous gold assays were returned for samples from:

1. gossans in the sediments, particularly those associated with pyritic, graphitic argillite or shale,
2. gossans associated with volcanic-sedimentary contacts, and
3. the Hillside showing on NAM 3, where a branching series of quartz- and pyrite-bearing veins and lenses cut banded and sheared mafic volcanics. The main vein is 1 to 2 m wide and traceable for 50 m. The best assay was 5950 ppb Au.

SHILL and TANQ CLAIMS

Tanqueray Resources Ltd.	Gold, Base Metals
100, 625 4th Ave. SW	85 O/13,14; 86 B/3,4
Calgary, Alta.	64°00'N, 115°30'W

REFERENCES

Lord (1942); McGlynn (1963); Smith (1963).
DIAND assessment report: 082564.

PROPERTY

SHILL 1-2 and TANQ 1-2 (3117 ha).

LOCATION

The claims are 200 km northwest of Yellowknife (Figs. 8-43, 8-45).

HISTORY

The claims were staked in January 1985 and transferred to Tanqueray Resources in 1987.

DESCRIPTION

Claims cover the southern extension of Indin Lake metavolcanics, foliated, layered amphibolite schists, enveloped by overlaying metasediments, schists and paragneiss.

CURRENT WORK AND RESULTS

Between November 7-10, 1987 a 275 km heliborne Dighem III electromagnetic/resistivity/magnetic/VLF EM survey over two overlapping grids identified numerous geophysical anomalies.

CASS and DAVE CLAIMS

Following Echo Bay's discovery of stratiform gold on the KIM claims in 1984, Taiga Consultants Ltd. had several claim groups staked, including CASS 7-9 and DAVE 3-9, to cover favourable stratigraphy along the volcanic-sediment contact in the Indin area. These properties were optioned and follow-up work during 1986-87 on CASS 7, CASS 9, DAVE 6 & 7, and DAVE 8 & 9 consisted of heliborne geophysics, and on CASS 8 and DAVE 3-5, geologic mapping and prospecting.

CASS 7 CLAIM

Manson Creek Resources Ltd.	Gold
410, 1122 4th St. SW	86 B/06
Calgary, Alta., T2R 1M1	64°22'N, 115°19'W

REFERENCES

Frith (1986); Stanton *et al.* (1954).
DIAND assessment report: 082132.

PROPERTY

CASS 7 (502 ha).

LOCATION

The property is adjacent to and northwest of the KIM claims, 200 km north-northwest of Yellowknife (Figs. 8-43, 8-44).

HISTORY

The claim was staked in December, 1984.

DESCRIPTION

The property is underlain by Archean supracrustal rocks of the Yellowknife Supergroup (Stanton *et al.*, 1954), including agglomerates, turbidites and metabasalts forming a steeply dipping, north-northeasterly trending succession flanked by a granitic pluton to the west of the property. The supracrustals are cut by northwest-trending gabbroic Proterozoic dykes and faults.

CURRENT WORK AND RESULTS

In 1985, 40 line-km of VLF EM and magnetometer survey were flown by Dighem Ltd. on CASS 7. Conductors coincide approximately with the contact between metavolcanics and metasediments, and the contact zone is more magnetic than the adjacent formations.

In 1986, a two-person crew geologically mapped and collected 56 samples from quartz veins and gossanous zones in all rock types for gold and silver assay. Three samples were anomalous: a rusty, quartz-veined gabbro dyke assayed 102 ppb Au; a gossanous basalt, cross-cut by quartz veins containing visible gold, flanking a granite sill assayed 584 ppb Au; and a tourmaline-rich quartz vein near the basalt-sediment contact assayed 1760 ppb Au.

CASS 8 CLAIM

Terra Mines Limited	Gold
P.O. Box 37	86 B/3
Winterburn, Alta., T0E 2N0	64°04'N, 115°26'W

REFERENCES

Frith (1986); Tremblay *et al.* (1953).
DIAND assessment report: 082307.

PROPERTY

CASS 8.

LOCATION

The claim is about 16 km southwest of Indin Lake, 195 km northwest of Yellowknife (Figs. 8-43, 8-44).

HISTORY

The claim was staked in late 1984.

DESCRIPTION

Metavolcanic rocks, now mainly foliated, layered, recrystallised amphibole-rich schists with lesser felsic tuffs and agglomerates, form a north-trending belt 1.5 to 2.5 km wide. To the east of this belt is porphyroblastic feldspar-quartz-biotite schist and paragneiss and to the west, equigranular paragneiss. Numerous pegmatitic dykes associated with a large granite pluton to the west cross-cut the rocks. Diabase dykes cross-cut all rock types. Contacts between metasediments and the resistant metavolcanics are marked by escarpments. Close to the contacts with metasediments, the volcanics are silicified and contain pyrite and pyrrhotite with minor chalcopyrite forming numerous gossans. Locally, over a strike length of 3000 m along the eastern contact, there is a hard, dense, magnetic exhalite with abundant pyrite and pyrrhotite which has been trenched. This contact is in part sheared and is interpreted as a thrust.

CURRENT WORK AND RESULTS

The claim was mapped and prospected. Selected areas, including trenches and gossanous zones were mapped and prospected in detail.

CASS 9 and DAVE 8, 9 CLAIMS

Delaware Resources Corp.	Gold
100, 1300 - 8th St. SW	86 B/3; 85 O/13,14
Calgary, Alta., T2R 1B2	64°05'N, 115°23'W;
	63°54'N, 115°28'W

REFERENCES

Frith (1986); Tremblay *et al.* (1953).
DIAND assessment reports: 082147, 082148.

PROPERTY

CASS 9 and DAVE 8, 9.

LOCATION

CASS 9 is northwest of Snare River at 64°05'N, 115°23'W and DAVE 8 and 9 are south of Snare River at 63°54'N, 115°28'W, 200 km north-northwest of Yellowknife (Figs. 8-43, 8-44).

HISTORY

The claims were staked in 1984. In 1985, 141 line-km of VLF EM and magnetometer survey was flown by Dighem Ltd. over the two claim blocks with a 200 m line spacing.

DESCRIPTION

The claims are underlain by mafic and felsic metavolcanics and overlying metasediments comprising nodular, garnet-bearing quartz-biotite schist, cordierite schist, quartz-biotite gneiss and carbonaceous schist. A band of acidic to cherty volcanics locally marks the volcanic-sedimentary contact. Northwest-trending Proterozoic diabase dykes cut all other rock types (Frith, 1986; Tremblay *et al.*, 1953). An east-northeast-trending topographic lineament within the mafic volcanics may represent a major shear zone coincident with a synclinal fold axis.

CURRENT WORK AND RESULTS

During September-October, 1986, 12 anomalous areas defined by the Dighem airborne survey were mapped and sampled on DAVE 8 and 9. Most were found to correspond

with mafic-felsic volcanic and volcanic-sediment contact zones that display evidence of shearing. Within these zones there are disseminated to massive pyrite with lesser amounts of chalcopyrite. The east-northeast-trending shear zone in the mafic volcanics is also expressed as a geophysical anomaly that is associated with the presence of sulfides. Twelve grab samples returned gold assays ranging from trace to 0.14 g/t Au.

DAVE 3-5 CLAIMS

Terra Mines Ltd.	Gold
Suite 202, 7608 - 103rd St.	85 O/14
Edmonton, Alta., T6E 4Z8	63°57'N, 115°10'W

REFERENCES

Frith (1986); Lord (1942); Wright (1954).
DIAND assessment reports: 082306, 082308.

PROPERTY

DAVE 3-5.

LOCATION

The claims are between 160 and 176 km northwest of Yellowknife. DAVE 4 is on the southeast shore of Wijinnedi Lake and DAVE 3 and 5 are about 29 km southwest of Indin Lake (Figs. 8-43, 8-44).

HISTORY

Terra Mines Ltd. acquired the DAVE claims from Taiga Consultants in the summer of 1986. Work on DAVE 4 was conducted as a joint venture agreement between Terra Mines Ltd. and Dynagold Resources Ltd.

DESCRIPTION

Archean sedimentary and volcanic rocks, metamorphosed to medium and high grades, underlie the claims (Lord, 1942; Wright, 1953; Frith, 1986). Volcanic rocks on DAVE 4 are mainly intermediate to mafic, garnet amphibolite schists and pillowed flows, with minor intercalated rhyolite and sedimentary rocks. Felsic, intermediate and mafic fragmental volcanic units are abundant on DAVE 3 and 5, with lesser amounts of rhyolite and pillowed and massive mafic-intermediate flows. A bright green micaceous mineral, possibly mariposite or talc was found sporadically throughout DAVE 3 and 5 in contorted tuffaceous rocks associated with quartz veins. Cordierite-andalusite schists and paragneiss represent a metamorphosed greywacke-argillite sequence. Locally, volcanic-sediment contacts are marked by gossans and limestone-dolomite.

The more competent volcanic lithologies may form a homoclinal sequence, whereas both the sedimentary rocks and fragmental volcanic units are isoclinally folded about east- or northeast-trending axes. Small scale, north-plunging folds are also documented. Some topographic lineaments represent shear zones. Gossans are noted in sheared felsic and mafic volcanic rocks along some of these zones.

CURRENT WORK AND RESULTS

Geological mapping, prospecting and sampling of the claims was carried out between July and September 1986. Prospecting targets included the sediment-volcanic contact, gossans in both sedimentary and volcanic rocks, linear fractures and quartz veins or lenses.

A gossan along the volcanic-sediment contact on DAVE 4 marks a zone of black exhalite and graphitic schist containing erratic stringers, veinlets and disseminations of pyrite and minor pyrrhotite. Two samples from this contact zone assayed 0.041 g/t Au. Rusty zones along the sediment-volcanic contact on DAVE 3 and 5 contain pyrite, pyrrhotite and minor chalcopyrite.

A quartz vein in rusty sedimentary rocks on the DAVE 4 property, 122 m long and 0.15 to 0.37 m wide assayed trace gold, with one sample assaying 0.17 g/t Au. On DAVE 3 and 5, veins of quartz, calcite, amphibole and chlorite that form lenses, saddle-reefs and tension gashes are noted near fold closures. They generally parallel foliation and fold axes trends and have discontinuous lengths of 4.6 to 6.1 m. Associated sulphide minerals are pyrite, pyrrhotite and chalcopyrite. Assays of 0.34 to 0.55 g/t Au were obtained from quartz veins with minor to no visible sulfides.

DAVE 6 & 7 CLAIMS

Manson Creek Resources Ltd.	Gold
410, 1122 - 4th St. SW	85 O/13
Calgary, Alta., T2R 1M1	63°57'N, 115°37'W

REFERENCES

Wright (1954).
DIAND assessment report: 082132.

PROPERTY

DAVE 6 and 7 claims (1736 ha).

LOCATION

The claims are 190 km north-northwest of Yellowknife (Figs. 8-43, 8-44).

HISTORY

The claims were staked in December, 1984 and have now lapsed.

DESCRIPTION

The property is underlain by Archean supracrustal rocks of the Yellowknife Supergroup (Wright, 1954), including metaturbidites, metabasalts and metamorphosed felsic to intermediate volcanics. The supracrustals trend northeasterly and are steeply dipping (Fig. 8-43).

CURRENT WORK AND RESULTS

In 1985, 110 line-km of VLF EM and magnetometer survey was flown by Dighem Ltd. over the claims. Several geophysical anomalies were identified that appear to coincide with the contact between metasediments and metavolcanics.

BEAR 1-3

Comaplex Minerals Corp.	Gold
901, 1015 - 4th St. SW	85 N/8
Calgary, Alta., T2R 1J4	63°20'N, 116°15'W

REFERENCES

Lord (1942).
DIAND assessment report: 082840.

PROPERTY

BEAR 1-3.

LOCATION

The claims are centred on Strutt Lake on the Snare River, 150 km northwest of Yellowknife.

HISTORY

Gold exploration dates back to the late 1930's in the area and trenches were found on the property.

DESCRIPTION

The claims are underlain by metaturbidites of the Emile-Snare River supracrustal belt. This north-trending, 75 km long belt is up to 14 km wide and connects Indin Lake supracrustal belt to Russell Lake supracrustal belt. The belt comprises strongly foliated, amphibolite-grade Yellowknife Supergroup greywacke and shale intruded by porphyritic quartz-feldspar dykes which sometimes contain disseminated sulphides, principally arsenopyrite. Exposed in trenches, sheared dykes and sediments are cross-cut by quartz veins containing base metal sulphides.

CURRENT WORK AND RESULTS

In 1987, 733 1 to 3 lb. lake-bottom sediment samples were collected using a Standard GSC Torpedo dropped from a Huges 500D helicopter. Samples were analysed for gold, silver, arsenic, bismuth, copper and zinc to define anomalous areas for follow-up work.

RUSSELL LAKE - SLEMON LAKE SUPRACRUSTAL BELT

The Russell Lake-Slemon Lake supracrustal belt is in the southwestern Slave Structural Province. The supracrustal rocks, belonging to the Archean Yellowknife Supergroup, form a northerly trending belt that extends to the Emile River area (Lord, 1942) and is bounded and intruded by granitic batholiths and plutons (Fig. 8-54). Geological mapping at a scale of 1 inch to 4 miles by Lord in the late 1930's (Lord, 1942), and the map of Jolliffe (1936), included the Russell-Slemon lakes area. Henderson (1985) mapped the area around the southern part of Russell Lake. Jackson (1988) mapped the Russell and Slemon lakes area in greater detail (at a scale of 1:30 000).

Supracrustal rocks include minor amounts of mafic and felsic metavolcanics and abundant greywacke-mudstone metasediments, which represent a turbidite sequence similar to that found elsewhere in the Slave Province. The metasedimentary succession at Russell and Slemon lakes is characterized by abundant oxide and silicate amphibolitic iron formation that is locally sulfide rich (pyrite, arsenopyrite and pyrrhotite) and auriferous. Thus, the metasediments are distinct from those of both the Indin Lake and Yellowknife supracrustal belts and are more comparable to metasediments in the Point Lake-Contwoyto Lake (Lupin) region of the north-central Slave Province.

The supracrustal rocks have undergone at least three phases of folding, with F_1 and F_2 isoclines refolded about more open F_3 folds. Three foliation subsets post-date F_2 isoclines. Two major sets of post-Archean faults transect the area: north-northwesterly trending sinistral faults and easterly trending dextral faults. Quartz and quartz-carbonate veins were injected throughout the deformational history of the area.

Metamorphic grade ranges from greenschist to amphibolite facies. Within the metasedimentary rocks this transition is marked by a regional cordierite isograd. The isograd parallels the contact between the supracrustal rocks and the bounding granitic rocks and is offset by post-Archean faults.

The most significant gold find in iron formation is the BUGOW deposit at Cabin Lake which has estimated reserves of 70 000 tons of 10.29 g/t Au. Gold is hosted in sulfidic and amphibolitic iron formation that is interbedded and isoclinally folded with cordierite-bearing metasedimentary rocks. Other gold showings in iron formation include SP claims and North Slemon Lakes claims area (SAP showing), which are also contained within medium-grade metasediments, just above the cordierite isograd. However, iron formation within low-grade metasediments is also reported to contain anomalous amounts of gold (SHO and ORCA claims).

In the Russell Lake-Slemon Lake supracrustal belt, gold is found in a number of other geological environments including:

1. In mafic metavolcanics--MOS claims at Mosher Lake, which contain estimated reserves of 3 190 662 t grading between 2.40 and 5.14 g/t Au (DIAND assessment report 080774), or 500 774 t of 2.81 g/t Au for the main zone (DIAND assessment report 062166);

2. In quartz vein stockwork in greywacke--PHAROAH claims at Gold Island on Mosher Lake;

3. In quartz veins within granodiorite--Seven ores showing in southern Russell Lake area;

4. In shear zones developed within iron formation--Zone 15 in the north Slemon Lake area;

5. Associated with quartz-feldspar phyric granodioritic dykes which have intruded iron formation--El Grande showing in the north Slemon Lake area;

6. In quartz-feldspar phyric granodiorite intruded near or along the contact between mafic metavolcanics and metasediments--RUST showing in the south Russell Lake area.

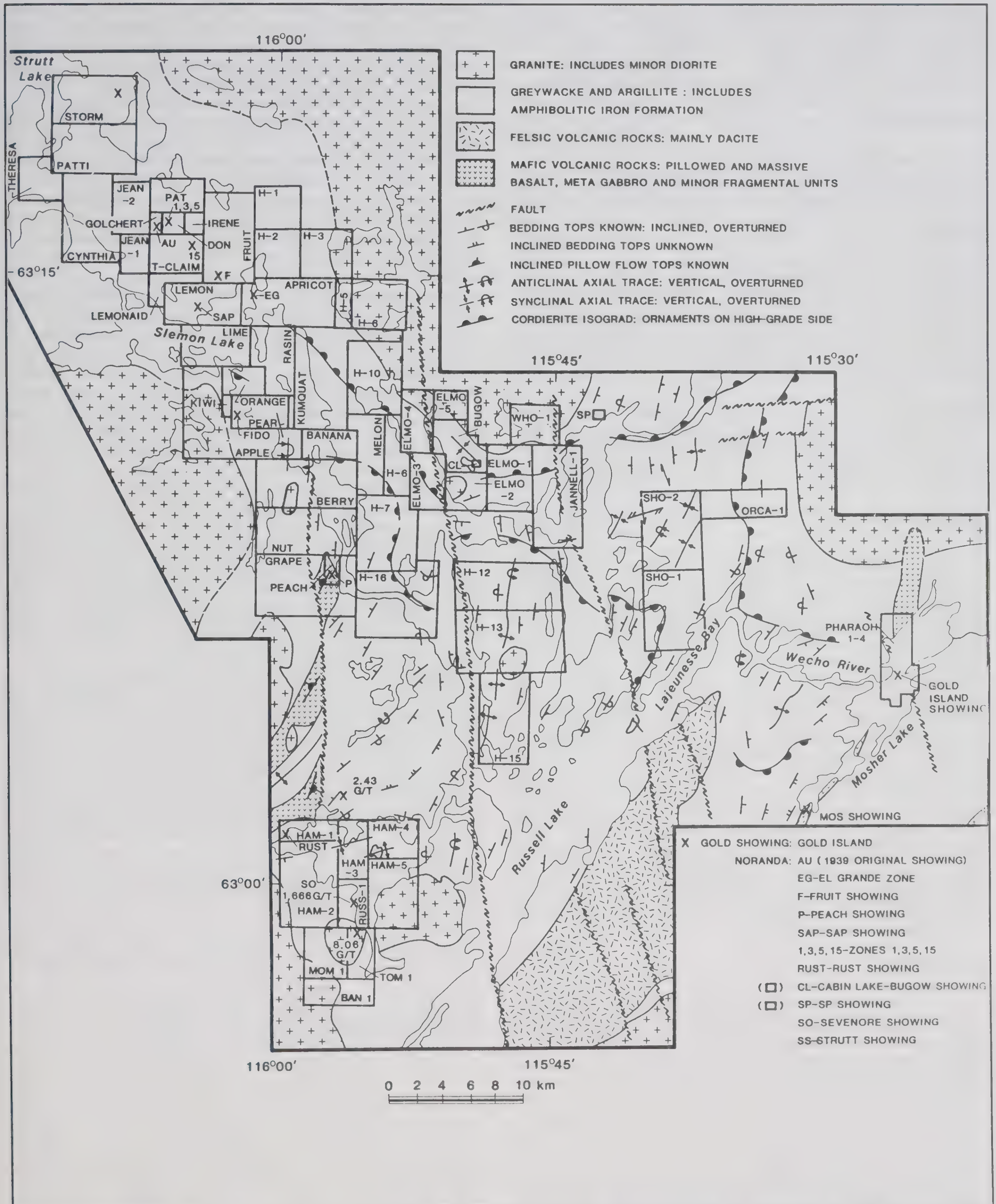


FIGURE 8-54: *Geology, gold showings and claim boundaries where 1986-87 work is reported in the Russell Lake-Slemon Lake area.*

SLEMON LAKE PROJECT

Noranda Exploration Co. Ltd. | Gold
4 - 2130 Notre Dame Ave. | 85 N/1,8; 85 O/4
Winnipeg, Man., R3H 0K1 | 63°16'N, 116°05'W

REFERENCES

Jackson (1988); Lord (1942, 1951).
DIAND assessment reports: 060069, 061574, 081634, 081786, 082305, 082509, 082524, 082638, 082766.

PROPERTY

JEAN 01, JEAN 02, LEMON, LEMONAID, THERESA, STORM, PATTI, CYNTHIA, KIWI, LIME, ORANGE, PEAR, PEACH, PLUM, BANANA, BERRY, GRAPE, NUT, APPLE, RAISIN, FRUIT CLAIM, APRICOT CLAIM, KUMQUAT CLAIM, MELON CLAIM, CHERRY, DONNA, PAT-85-1, DON, IRENE, GOLCHERT AND T-CLAIM.

LOCATION

The contiguous claims are centred on Slemon Lake, 45 km north of the village of Rae and 120 km northwest of Yellowknife.

HISTORY

The exploration history of the claim group from the late 1930's up to 1972 was summarised in table form by Seaton and Crux (1985). In 1972-73 Anglo United Development Corp. Ltd. reported that quartz veins cutting amphibolite contained up to 12.34 ppm Au across 0.61 m (DIAND assessment report 060069). In 1983 Host Ventures Ltd. drilled 9 holes on the DON claims and reported assays of up to 98 ppm Au across 1.5 m of sulfide-bearing greywacke and breccia (DIAND assessment reports: 081786, 061574). Noranda acquired the JEAN, LEMON and LEMONAID claims in 1981 and conducted prospecting, mapping and geophysical surveys in 1981-82, during which gold anomalies were detected in sulfide-bearing iron formation (DIAND assessment report 081634). Samples collected in 1984 returned assays of up to 12.5 ppm Au across 0.8 m. The T, PAT, IRENE and GOLCHERT claims were acquired by Noranda in 1985 and 1986 under seperate agreements with Interglobe Resources Ltd., Ghost Lake Resources Ltd. and the Irly Bird Syndicate (DIAND assessment report 082509). Noranda staked the remaining claims between July 1985 and October 1986.

DESCRIPTION

The property is underlain by sedimentary and subordinate mafic volcanic rocks that form a north-northwesterly trending arm of the Russell Lake-Slemon Lake supracrustal belt. The supracrustals are bound to the north, east and west by granitic intrusions (Fig. 8-54; Lord, 1942; Jackson, 1988). The cordierite isograd is traced through the sedimentary rocks that underlie the property. The presence of this isograd is significant as sulfide content of iron formation increases coincident with the increase in metamorphic grade.

Sedimentary rocks underlying the northern claims (PAT, IRENE, GOLCHERT and T) comprise interbedded greywackes and shales (argillites), with greywackes being slightly more abundant than argillites. Beds are generally <1 m wide, well graded and can be traced for hundreds of metres along strike. Rhythmically bedded greywacke-phyllite turbidites are exposed along the west shore of Slemon Lake and on the islands. Pelitic rocks comprising fine-grained, dark grey to black phyllite and slate predominate along the north and east shores of Slemon Lake. Numerous quartz veins and stringers, both discordant and conformable, are associated with the pelitic sequence.

Within the sedimentary sequence are interbedded silicate-sulfide and oxide iron formation. Iron formation is often developed at the transition between greywacke and argillite units, but is also found within the greywacke succession. At least three zones of iron formation have been mapped on the west shore of Slemon Lake and correlate with magnetic anomalies. The iron formation can be traced for 17 km along strike from southeast of Strutt Lake to southwest of Slemon Lake. Zones of iron formation range in thickness from 10 m to 70 m, consisting of several smaller bands within this interval, and are also traceable for hundreds of metres along strike. Silicate-facies amphibolitic iron formation locally contains pyrrhotite and pyrite with lesser amounts of arsenopyrite, marcasite, chalcopyrite, sphalerite and galena. Sulfide content varies, ranging from trace amounts to about 10%. Oxide iron formation consists of interbanded magnetite, chert and biotite-rich layers and forms weather resistant ridges.

Granitoid intrusions are multiphase and range from granite to granodiorite with lesser amounts of diorite. They are pink to light grey, variably foliated, medium to coarse grained and typically equigranular. Granodioritic quartz-feldspar porphyry sills, which may be related to the larger granitic intrusions, intrude metasedimentary rocks. The sills are 1 to 25 m wide and are locally folded. Gabbro and diabase dykes up to 50 m wide, with north, northwest and north-northeast trends, are also noted. Fine-grained pyrrhotite and trace magnetite combine to give a magnetic signature to diabase dykes.

Three phases of folding have been outlined; the first two resulted in isoclinal folds, as documented elsewhere in the region (Jackson, 1988). F_1 forms large scale, tight isoclines with axial trends ranging from north-northeast to north-northwest. Broader F_2 isoclines have northwest-trending axial traces. F_3 folds are open and gently warp F_1 and F_2 folds about east-northeast-trending axial traces. Three distinct cleavages are recognised, which are considered axial plane cleavages to the defined folds. Shear zones parallel F_2 axial planes and consist of schistose oxidized zones with chloritic alteration, minor quartz veins and local pyrrohtite, pyrite and arsenopyrite enrichment. Similar but less well developed shear zones are noted along F_1 axial traces.

Several gold-bearing zones in a variety of geological environments have been identified on Noranda's Slemon Lake claims. Anomalous gold concentrations (>100 ppb Au) are associated with: sheared, silicified and sulfidised oxide- to silicate-facies iron formation; high sulfide content; proximity to quartz-feldspar porphyry dykes and; proximity to the regional metamorphic isograd (highest gold assays obtained from the lower grade rocks adjacent to the isograd). The main gold showings are indicated on Figure 8-54 and described below.

Sap showing: Several parallel units of oxide- and silicate-facies iron formation, up to 6 m wide, are interbedded with turbidites. Sulfide-rich iron formation yielded up to 12.48 ppm Au. Silicification, quartz veining and sulfide-enrichment (pyrite, pyrrhotite and arsenopyrite) that is associated with the gold may be related to a north- to northeast-trending fault that flanks and parallels the zone of iron formation. Sap West showing, which yielded up to 64.4 g/t Au, is associated with arsenopyrite

along the margins of a quartz-feldspar porphyry where it intrudes iron formation.

Zone 8: A wide gossan zone of sheared arsenopyrite-bearing pyritic shale and altered iron formation contains quartz veins and 10% sulfides. Resampling of a trench (1947-48) returned low, sporadic gold content (best analysis 0.22 g/t Au).

Zone 15 (T-CLAIM): Sheared and sulfidised silicate- to oxide-facies iron formation has a strike length of over 800 m. Gold and sulfide mineralisation was accompanied by silicification and chlorite alteration. Sampling of trenches (1946) and surrounding outcrops yielded assays ranging from 1.1 g/t Au over 3.6 m to 5.17 g/t Au over 3.3 m. The best assay from a grab sample contained 6.86 g/t Au over 1.5 m, 12% Cu and 690 g/t Ag.

El Grande zone: Assays of up to 10.65 ppm Au were obtained from arsenopyrite-rich, quartz-flooded samples collected from the contact between a felsic dyke and sheared turbidites. The best assays from saw-cut channel samples were 0.31 ppm Au across 0.75 m of felsic dyke and 0.40 ppm Au across 1.1 m of sheared country rock.

Zone 9: A zone of sheared and gossanous iron formation is intruded by a quartz-feldspar porphyry sill. Gold is associated with arsenopyrite, concentrated along the margins and contacts of the sill. Sampling of existing trenches returned 5.14 g/t Au over 1.83 m and 3.43 g/t Au over 2.07 m.

Fruit showing: A zone of chloritic, quartz-flooded phyllite carries 1 to 3% finely disseminated arsenopyrite needles. Assays ranged from 1.23 to 5.16 ppm Au.

Fido and Peach showings: Gold (up to 12.6 ppm Au) is associated with local concentrations of arsenopyrite in quartz veins cutting felsic porphyry dykes. The dykes range in width from 25 to 100 m and have been traced for 300 to 400 m.

Zone 1 and Zone 5 (DON claim--Interglobe Resources Ltd. option): A zone of quartz veins cutting turbidites, 82 m in length, is exposed in 1947 trenches. Visible gold is common in the quartz, which also contains pyrite and trace arsenopyrite. A description of Zone 1 is given in Lord (1951, p. 259-262). Zone 5, adjacent to Zone 1, consists of quartz veins in a shear carrying 3 to 5% arsenopyrite and 15 to 20% pyrite. An assay of 23.0 ppm Au was obtained from one grab sample.

Zone 3 (DON claim--Interglobe Resources Ltd. option): A zone of stockwork quartz veins cross-cuts turbidites approximately 600 m north-northeast of Zone 1. Veins are discontinuous and subhorizontal. A description of Zone 3 is given in Lord (1951, p. 259-262).

Strutt Lake showing: Massive arsenopyrite is developed in narrow silicified zones within sheared oxide/silicate facies iron formation. Composite grab samples yielded up to 9.43 g/t Au and 2.06 g/t Au.

CURRENT WORK AND RESULTS

In May 1986 a Dighem III geophysical survey was flown over a large portion of the claim area. During the spring of 1987 a 133 line-km grid was established over the north Slemon Lake area and an IP survey was conducted over portions of the grid, using both gradient array IP and dipole dipole IP. Detailed geological and structural mapping, prospecting, sampling, trench resampling and ground geophysical surveys were also carried out in 1986-87.

The airborne survey outlined ten conductive zones attributable to bedrock sources. The magnetic survey was useful in delineating granite-supracrustal contacts and anomalies that may correlate with either iron formation or mafic dykes. Ground geophysical surveys outlined four areas as priority targets based on coincident magnetic and EM anomalies. Anomalies found during the dipole-dipole IP survey on the SAP showing corresponded to zones of weakly sulfidised iron formation.

Six outcrops of iron formation along the shoreline of Slemon Lake were saw-channel sampled. The best assay from 97 samples was 0.47 ppm Au across 1.3 m (DIAND assessment report 082509).

During October-December 1987 eight holes totalling 1116.4 m were drilled on the claims (DIAND assessment report 082766) as follows: three holes on Zone 15 (GL-87-1 to GL-87-3); one hole on Zones 1 and 5 (GL-87-4); two holes on the northern extension of Zones 1 and 5 (IG-87-1, 2) and two holes on the SAP showing (R/S-87-1, 6). GL-87-1 intersected iron formation with 1 to 5% pyrrhotite, 1% pyrite and trace magnetite and sphalerite. The highest assay of 0.34 g/t Au over 0.5 m coincided with 5 to 6% pyrrhotite. Iron formation intersected in GL-87-2 contained 5 to 7% pyrite, 1 to 2% pyrrhotite, with a maximum assay of 0.34 g/t Au over 1.0 m. In this hole a zone of greywacke containing disseminated arsenopyrite assayed 3.8 g/t Au over 1.5 m. The best assay from GL-87-3 yielded 1.54 g/t Au over 1.0 m, in iron formation with 1 to 2% pyrite and pyrrhotite. GL-87-4 intersected Zone 1 shear zone, an altered and silicified zone approximately 10 m thick, containing numerous quartz veins and stringers and quartz-feldspar porphyry sills. This zone assayed up to 0.69 g/t Au over 1.0 m. Silicate-facies iron formation was also intersected, containing 1% pyrrhotite and 1% combined arsenopyrite and pyrite and assaying up to 0.51 g/t Au over 0.3 m.

Assays for hole R/S-87-1 (Sap showing; DIAND assessment report 082766) ranged from 1.72 g/t Au over 2.2 m up to 34.68 g/t Au over 1.0 m, with an averaged assay of 10.94 g/t over 4.0 m.

BUGOW CLAIMS

Highwood Resources Ltd.	Gold
700 - 1177 W. Hastings St.	85 O/4
Vancouver, B.C., V6E 2K3	63°14'N, 115°50'W

REFERENCES

Lord (1942); Brophy (1986); Seaton *et al.* (1987); Jackson (1988).

DIAND assessment reports: 082555, 082556, 082593, 082594.

PROPERTY

EMLO 1-5, H 6, H 10, WHO 1, BUGOW 1-20 (3943 ha).

LOCATION

The BUGOW gold property is 110 km northwest of Yellowknife, at the north end of Russell Lake (Fig. 8-54).

HISTORY

The property was staked by M.F. Thompson in 1939, restaked by Mr. Andy Bugow in 1945; in 1946 it was acquired by Andrew Yellowknife Mines Ltd. The claims were transfered to Rio Algom Ltd. in 1962, to Highwood Resources Ltd. in 1982, and to Cominco Ltd. in 1984. Six holes were drilled on

the property in 1985 (Seaton *et al.*, 1987). The Cominco option expired in 1986 and the property reverted to Highwood Resources Ltd.

DESCRIPTION

The geology of part of the BUGOW claims area is shown in Figure 8-55. The claims are mainly underlain by Archean metasedimentary rocks, a sequence of interbedded greywacke and argillite, which are now cordierite and/or andalusite schists. Within these are lesser amounts of amphibolitic iron formation and garnetiferous schist. In the northern part of the claim group metasedimentary rocks are intruded by granite, which forms part of a batholith (Fig. 8-54). South of Cabin Lake the metasediments are intruded by a small granitic pluton. Pegmatitic, granitic, felsic porphyry and mafic dykes intrude the metasedimentary rocks and diabase dykes intrude all Archean units.

On the BUGOW claims first phase isoclinal folds (F_1) are northwesterly oriented and crossed by second phase, and possibly third phase (F_2, F_3), more open, northeasterly oriented folds (Fig. 8-55). The most prominent cleavage developed on the property is northwesterly trending, oriented 5° to 15° clockwise from bedding and is axial planar to minor folds that post-date F_1 (Brophy, Sept. 1986 Property Visit Report).

An east-trending regional metamorphic isograd just to the south of the property marks the boundary between low-grade rocks to the south and medium-grade (cordierite-andalusite-bearing) rocks to the north. The isograd parallels the margin of the granitic batholith to the north.

Gold is associated with iron formation, which comprises amphibole-rich siliceous beds that vary in width from several centimetres to over 10 m, and have discontinuous strike lengths of over 1 km (Fig. 8-55). Several distinct iron formation units have been identified on the property. Ampibolitic iron formation locally contains siliceous nodules, garnets and up to 25% sulfides. Pyrite, pyrrhotite and arsenopyrite, the main sulfides, vary from laminated or bedded to disseminated.

Ford (1988) has suggested that deformation and metamorphism of the amphibolitic units led to the concentration of gold in fold hinge zone areas, particularly where F_2 or F_3 folds are superposed on F_1 folds.

CURRENT WORK AND RESULTS

Drilling and detailed mapping carried out by Aber Resources Ltd. in 1986 and 1987 outlined a high-grade zone of about 70 000 t of 10.29 g/t Au. Freeport-McMoRan Gold Company has since acquired the option to earn 51% interest in the BUGOW property.

Between April and June 1987 Freeport-McMoRan contracted MPH Consulting Ltd. to carry out a helicopter borne geophysical survey (electromagnetic, resistivity, magnetic and VLF EM) and an extensive ground geophysical survey (magnetic, VLF EM, MaxMin HLEM and IP/resistivity). Subsequent work included bedrock trenching, rock-chip sampling (EMLO 1, 5 and H-10; DIAND assessment report 082593) and 68 m of BQ diamond drilling (EMLO 2; DIAND assessment report 082594). This work did not result in either the discovery of new economic gold-bearing zones or the enlargement of previously known zones.

JANELL-1

Kelmet Resources Ltd.	Gold
310, 441 - 5th Ave. SW	85 O/4
Calgary, Alta., T2P 2V1	63°10'N, 115°45'W

REFERENCES

Lord (1942); Jackson (1988).
DIAND assessment report: 082622.

PROPERTY

JANELL-1 (1046 ha).

LOCATION

The claim is 100 km northwest of Yellowknife, at the north end of Russell Lake (Fig. 8-54).

HISTORY

JANELL-1 was registered in May 1986.

DESCRIPTION

The claim is underlain mainly by Archean metasedimentary rocks (Fig. 8-54), moderately to thickly bedded, coarse-grained greywacke with subordinate thinly bedded argillite (Jackson, 1988). Iron formation is found to the west, north and east of the property, but may be only a minor component of the claim area (Jackson, 1988). The metasedimentary rocks are bounded to the north by a granitic batholith.

Bedding trends east-northeast in the southern part of the claim, but northerly in the north and central area. Two regional cleavages are developed with easterly and northerly trends.

A regional metamorphic isograd, marking the first appearance of cordierite and/or andalusite, is parallel to the margin of the granitic batholith in the northern claim area. A north-trending dextral fault transects the centre of the claim and offsets the metamorphic isograd.

CURRENT WORK AND RESULTS

During July 1987, Aerodat Ltd., on behalf of a joint venture agreement between Asamera Inc. and Kelmet Resources Ltd., flew 250 line-kms of electromagnetic, VLF EM and magnetometer surveys.

The survey data indicate:

1. The presence of numerous faults.

2. The most prominent magnetic anomalies are correlated with a diabase dyke and other small mafic intrusions rather than iron formation.

3. The rocks underlying Russell Lake may be enriched in mafic components relative to those of the surrounding exposed terrane.

FIGURE 8-55: *Geology of the BUGOW claims, Cabin Lake area.*

H CLAIMS

Aber Resources Ltd.
400, 805 - 8th Ave. SW
Calgary, Alta., T2P 1H7

Gold
85 O/4
63°07'N, 115°50'W

REFERENCES

Lord (1942); Jackson *et al.* (1986a); Jackson (1988).
DIAND assessment report: 082664.

PROPERTY

H-12, H-13 (2092 ha).

LOCATION

The claims are approximately 130 km northwest of Yellowknife and a few kilometres south of the BUGOW property at Russell Lake (Fig. 8-54).

HISTORY

The claims were recorded in August 1986 and are forming part of a joint venture between Aber Resources and Tanqueray Resources Ltd.

DESCRIPTION

The property is underlain by north-trending, isoclinally folded sedimentary rocks which have been regionally metamorphosed to medium grade and have been intruded by a small granitic pluton. Sedimentary rocks in the western part of the property are thin-bedded argillites with minor interbedded amphibolitic iron formation, and those in the eastern part are thick-bedded greywackes which lack iron formation.

A northerly trending dextral fault parallels the shoreline of Russell Lake in the extreme western part of the property.

CURRENT WORK AND RESULTS

Work in July 1987 concentrated on mapping and sampling of the western part of the claims, to evaluate a north-trending ironstone reported in Jackson *et al.* (1986). The ironstone is a garnetiferous amphibolite, containing quartz ovoids, and is about 3 to 5 m wide and folded at its south end. Pyrite and arsenopyrite content within the ironstone is low and the highest gold assay obtained was 0.60 g/t Au.

RUSS 1, HAM 1-5

Noranda Exploration Co. Ltd.
4 - 2130 Notre Dame Ave.
Winnipeg, Man., R3H 0K1

Gold
85 J/13; 85 O/4
63°00'N, 115°55'W

REFERENCES

Lord (1942); Henderson (1985); Seaton and Crux (1985); Jackson (1988).
DIAND assessment reports: 081633, 082415, 082766.

PROPERTY

RUSS 1, HAM 1-5.

LOCATION

The claim group is about 20 km north of Rae and 104 km northwest of Yellowknife and is on a west bay of Russell Lake.

HISTORY

The property was originally part of the SEVENORE 1-12 claim group staked in 1945 upon the discovery of gold by K. Murray. The original Sevenore main showing, auriferous quartz veins in a granodiorite plug, is on the RUSS 1 claim. In 1946 the claims were acquired by Fort Rae Gold Mines Limited. The property was restaked later as the EKK claims. These lapsed and were restaked as TIP 1-28 by Kerr Addison Mines Ltd.

The RUSS 1,2 claims were recorded in May 1981 and the BET 1-7 claims were recorded in September 1981 (Seaton and Crux, 1985; DIAND assessment report 081633). The RUSS 2 claim was allowed to lapse and HAM 1-5 claims were staked in September 1986 (covering the old RUSS 2 and parts of BET 1-7 claims).

DESCRIPTION

The claims are underlain an Archean sequence of alternating thinly bedded argillite and more abundant thickly bedded greywacke and by granite-granodiorite plutons and pegmatitic, granitic, felsic porphyry and mafic dykes. Within the metasediments are amphibolitic and garnetiferous iron formation that are locally sulfide bearing (pyrite, pyrrhotite and arsenopyrite) and generally have a higher magnetite content than those mapped at Slemon Lake (DIAND assessment report 082766). In the northwestern part of the claim group mafic volcanic rocks form an elongate northeast-trending, southeast-facing sequence of massive and pillowed flows, fragmentals and metagabbro (Jackson, 1988). An extensive granitic terrane is west of the claims.

Bedding trends within the sedimentary rocks change from northerly in the southern area to northeast in the northern part of the claim group. Three phases of folding are documented in the sedimentary sequence and complex fold interference patterns are observed in lakeshore outcrops of argillaceous units and iron formation (Jackson, 1988).

CURRENT WORK AND RESULTS

In October 1986 major units of silicate oxide iron formation were mapped and trenches on the Sevenore showing were examined. During spring 1987 a 70 line-km grid was established and magnetometer and VLF surveys carried-out. Detailed mapping was conducted during the summer of 1987. Zones of interest defined by geophysical surveys correspond to iron formation and to the Sevenore showing. Surveys indicate the zone of mineralisation at Sevenore may extend 1200 m to the north.

The Sevenore showing is a series of discontinuous quartz veins, up to 1 m wide and 250 m long, hosted in a small granodiorite intrusion. Quartz veins contain pyrite, arsenopyrite, sphalerite, galena and native gold. Fine specks of gold are visible, and in one sample gold forms rims on sphalerite crystals. Visible gold was also found in quartz stringers within metasedimentary rocks. Iron formation within the sedimentary rocks surrounding the Sevenore stock assayed from 20 to 720 ppb Au. Samples from sheared iron formation assayed 3.05 g/t Au over 0.3 m.

Four holes totalling 737 m were drilled during October-December 1987 (DIAND assessment report 082766). Two holes (R/S-87-2,3) were drilled to test the Sevenore showing. The granodiorite stock contains disseminated sphalerite (from trace to 3%) and variable concentrations of arsenopyrite, pyrite and pyrrhotite. R/S-87-2 intersected visible gold in quartz veins that assayed 1 666.5 g/t Au over 0.35 m. Holes R/S-87-2 and 3 were also drilled to test a paired magnetic anomaly flanking the granodiorite, and hole R/S-87-4 tested the southern extension of this anomaly. These holes intersected banded oxide-facies iron formation, with narrow sulfide-rich bands, but no anomalous gold assays were obtained. Hole R/S-87-5, drilled on the northeastern shore of Russell Lake, was targeted on another magnetic anomaly and intersected 13.7 m of sulfide-rich (1 to 10% disseminated pyrite and pyrrhotite) iron formation, as well as intervals of banded oxide iron formation. Anomalous gold assays were not obtained.

BAN, MOM, TOM CLAIMS

Prolific Petroleum Ltd. — Gold
150, 1300 - 8th St. SW — 85 J/13
Calgary, Alta., T2R 1B2 — 62°58'N, 115°57'W

REFERENCES

Henderson (1985).
DIAND assessment report: 082069.

PROPERTY

BAN 1, MOM 1, TOM 1 claims.

LOCATION

The claims are on the western shore of Russell Lake, 17 km northwest of Rae and 80 km northwest of Yellowknife.

HISTORY

SEVENORE 1-12 claims were staked in 1945 by K. Murray upon discovery of the Sevenore Stock gold showing immediately north of the TOM claim. In 1946, Bear Exploration and Radium Limited explored the gold showing. The claims lapsed and were restaked several times, recently as the RUSS and BET claims by Noranda in 1981. Samples of rusty fractures and quartz veins in the Sevenore Stock assayed up to 35 ppm Au. Anomalous gold concentrations (up to 15 ppm) were also obtained from samples of iron formation. Noranda's RUSS and BET claims lapsed in 1982.

The MOM, TOM and BAN claims were recorded for Prolific Petroleum Ltd. in August of 1986, soon after Aber Resources Ltd. reported gold assays from iron formation near the north end of Russell Lake.

DESCRIPTION

The property is underlain by cordierite-bearing pelitic metasediments of the Yellowknife Supergroup containing numerous interbeds of siliceous, amphibole-rich, silicate- and oxide-facies iron formation and minor segments of sulphide-facies iron formation with which gold is sometimes associated. In the northeast corner of the property, Henderson (1985) has defined a circular granodiorite intrusion, 2 km in diameter, which hosts the Sevenore stock showings.

CURRENT WORK AND RESULTS

In 1987, 55.5 line-km of VLF EM and magnetometer surveys were completed over a cut grid. The VLF EM survey delineated a number of strong northeast- and northwest-trending conductors. Narrow, linear magnetic highs in the northwest of the claims may be attributable to iron formation. The main magnetic linear appears to describe the nose of a northwest-closing fold whose axial surface strikes northwesterly.

SHO and ORCA CLAIMS

Continental Pacific Resources Ltd. — Gold
830, 355 Burrard St. — 85 O/4
Vancouver, B.C., V6C 2G8 — 63°08'N, 115°38'W

REFERENCES

Jackson *et al.* (1986a); Lord (1942).
DIAND assessment report: 082145.

PROPERTY

SHO 1-2 (2007 ha), ORCA 1 (565 ha).

HISTORY

The claims were staked by Lou Covello and Navillus Holdings Limited and were optioned by Continental Pacific Resources Limited in 1986. There is no record of previous exploration on the property.

DESCRIPTION

The property is underlain by steep dipping, tightly folded, northeasterly trending, greenschist-grade turbidites and along the west shore of Lajeunesse Bay, silicate-facies iron formation on the southeast limb of an anticlinal structure (Fig. 8-54; Jackson *et al.*, 1986a).

CURRENT WORK AND RESULTS

In 1986, 112 line-km of HLEM and 105 line-km of magnetometer surveying at 10 m station spacing was completed over a cut grid. The grid is 160 line-km (Fig. 8-54). Along the shore of Lajeunesse Bay where iron formation is mapped (Jackson *et al.*, 1986a), line spacing was 80 m. The magnetic surveys identified a number of weak to moderate anomalies that are discontinuous along strike. Some of these appear to coincide with iron formation.

PHARAOH CLAIMS

D.G Thomas | Gold
Suite 1600 - 540 5th Ave. SW | 85 O/3
Calgary, Alta., T2P 0M2 | 65°06'N, 115°22'W

REFERENCES

Lord (1941, 1942, 1951); Henderson (1985).
DIAND assessment report: 082088.

PROPERTY

PHARAOH 1-4 (547 ha).

LOCATION

The property, approximately 40 km north of Rae and 90 km west-northwest of Yellowknife, covers the area surrounding and including Gold Island, on the north-central part of Mosher Lake (Fig. 8-54).

HISTORY

In 1938 Alex Mosher discovered gold on the small island in Mosher Lake, now called Gold Island, and the CORRINE claim group was staked. These claims lapsed and part of the property was restaked in 1944 as the HILL, MONTY and ROSE claims by Yellowknife Mining Syndicate. In 1947 J.E. Stevens drilled two short holes on the property. Huhill Yellowknife Mines Ltd. then acquired the property and during 1946-47 drilled a total of 4 277 m. In 1973, Seaforth Mines Ltd. restaked the property as the MAG group of claims and carried out geophysical work and diamond drilling. In 1975, magnetic, VLF EM and CEM electrical surveys were conducted by Noranda Exploration.

DESCRIPTION

Lord (1942) provides the only regional geological map of the area. Archean supracrustal rocks in the area form a northeasterly trending extension of the Russell Lake-Slemon Lake supracrustal belt. Greywacke with lesser amounts of argillite underlie the claims. Diamond drill logs and sections indicate that minor metavolcanic rocks and conglomerate are within the greywacke suite. Southwest of the property is an elongate northerly trending mafic volcanic unit and to the north and east the metasedimentary rocks are intruded by the Stagg Lake Granite (Fig. 8-54; Henderson, 1985).

The showing, a quartz stockwork zone within the metasedimentary rocks on Gold Island, has been described in detail by Lord (1941, 1951). Minerals within the stockwork includes pyrrhotite, pyrite, chalcopyrite, arsenopyrite and native gold.

The best gold assays on the property to date were from samples of core drilled in 1974 (6.51 g/t Au across 10.07 m including 19.20 g/t Au across 3.05 m and 7.89 g/t Au across 5.80 m).

CURRENT WORK AND RESULTS

Showings on Gold Island were examined in July 1986. The quartz stockwork is interpreted to be conformable to bedding within the metasedimentary rocks and to be folded by two and possibly three fold sets. Examination of previous diamond drill results indicates the quartz stockwork zone is open at depth.

YELLOWKNIFE SUPRACRUSTAL BASIN

Remnants of Archean Yellowknife Supergroup rocks at the southern edge of the Slave Structural Province stretching 120 km east of Yellowknife and nearly 200 km north from Great Slave Lake form the Yellowknife supracrustal basin (Padgham, 1981). Granodioritic intrusive rocks border the basin to the east, west and southwest whereas to the north the basin grades into migmatitic equivalents of the Yellowknife Supergroup. Although the southern limit of the basin is hidden under Great Slave Lake, it is interpreted to extend at least 10 km southwest (Gibb and Thomas, 1980). It is intruded by Aphebian alkaline granitoid rocks and intersected by the East Arm Fold Belt. The area of the basin is covered by parts of NTS 85 J, 85 O, 85 P and 85 I. Figure 8-56 depicts geology and major deposits of the basin. Figure 8-57 outlines geological maps for the area.

Yellowknife Supergroup rocks locally overlie metamorphosed and deformed basement granitoid plutons and gneisses however contacts are typically highly deformed and sheared. The Supergroup includes discontinuous volcanic belts. The principal ones, Yellowknife (Padgham, 1987) and Cameron-Beaulieu (Lambert, 1988), are between extensive complexes of granitic and gneissic rocks and, overlying, Yellowknife Supergroup greywacke-mudstone turbidites of the Burwash Formation. The turbidites represent the main basin fill derived from a mixed felsic volcanic and granitoid source. Local conglomerate and shallow-water lithic to quartz-rich sandstones are interpreted to define the basin margins, as may the volcanic belts (Henderson, 1985). The volcanic belts are thick accumulations of mainly basaltic to andesitic subaqueous flows, gabbroic sills and felsic volcanic complexes that built up above water level including Clan-Sito-Quyta Lake area, the Yellowknife area and Victory-Turnback-Sunset Lake area (Figs. 8-56, 8-57).

Rocks of the basin were complexly folded during at least two phases of deformation (Henderson 1985; Fyson 1987). The volcanic belts are steeply dipping homoclines. The relatively incompetent Burwash Formation sediments are complexly folded into steeply dipping isoclines of highly varied trend and wavelength and in places complex interference patterns are developed. The metamorphic pattern as outlined by the cordierite isograd is apparently controlled by local thermal anomalies associated with emplacement of granitoid plutons. Rocks along the margins of the basin, particularly in proximity to large plutons, are at amphibolite grade.

The majority of the granitoid plutons were intruded in the Late Archean (2.55-2.6 Ga), they include: (1) subvolcanic, stocks, dykes and sills associated with mafic to felsic volcanism, (2) syntectonic to late tectonic mesothermal tonalite-granodiorite batholiths and (3) late tectonic granodiorite-granite-leucogranite-pegmatite dykes, stocks and batholiths (Ayres and Cérny, 1982). Henderson (1985) formalized the terminology of the granitoid rocks in and around Yellowknife Basin; the majority belong to one of seven units: (1) Anton and (2) Sleepy Dragon complexes (3) Defeat (4) Stagg (5) Meander Lake and (6) Awry plutonic suites, and (7) Prosperous Granite.

Deposits of economic interest within supracrustal rocks of the Yellowknife basin (Fig. 8-56) include gold, in a variety of settings, base metals and pegmatites. Most gold production, in excess of 350 000 kg, has come from Giant Yellowknife Mine and NERCO-Con Mine where gold is in quartz-carbonate or quartz veins and lenses within brittle-ductile shear zones cross-cutting basalts of the upper Kam Group, Yellowknife volcanic belt. However, numerous small high-grade gold-bearing quartz veins in the sediments of the Burwash Formation have been mined, including Thompson-Lundmark, Camlaren and Ptarmigan

mines (Fig. 8-56) which have produced in total over 3300 kg of gold (Padgham, 1984). Other exploration targets for gold include: structurally controlled quartz veins hosted within metasediments, such as Discovery Mine (Fig. 8-56) which produced 1 t of gold; quartz veins and shear zones developed between lithologies with competency contrast, such as the Nicholas Lake deposit; along lithologic contacts, for example the MON deposit; and within iron-rich zones along volcanic-sedimentary contacts, for example showings on the TING, WAL, EQUINOX claim group and the LONGSPUR main showing. Volcanogenic massive sulphide deposits are hosted by the volcanic belts and within the Beaulieu River volcanic belt include the 1987 discovery, the polymetallic Sunrise deposit with reserves of 1.87 Mt grading 8.9% Zn, 4.2% Pb, 404.6 g/t Ag and 1.029 g/t Au, and the Turnback Lake deposits (Fig. 8-56).

Within the Yellowknife Basin numerous pegmatite dykes cross-cut mainly Burwash Formation turbidites to form the Yellowknife pegmatite field. The pegmatites demonstrate regional zonation relative to youngest Archean, commonly two mica granites. Zoned beryllium-rich pegmatites are closest to these intrusions, further out are columbium-tantalum-rich bodies and farthest away (up to 4 km) are simple lithium-rich pegmatites (Jolliffe, 1944; Mulligan, 1965; Kretz, 1968; Lasmanis, 1978; Wise *et al.*, 1985). Prospecting in the area for lithium and other rare elements such as beryllium, niobium, tantalum and tin began during the Second World War, and columbite-tantalite concentrates were recovered between 1946 and 1948. Canadian Superior Exploration Limited tested pegmatites in the area in the 1970's (DIAND assessment report 080274).

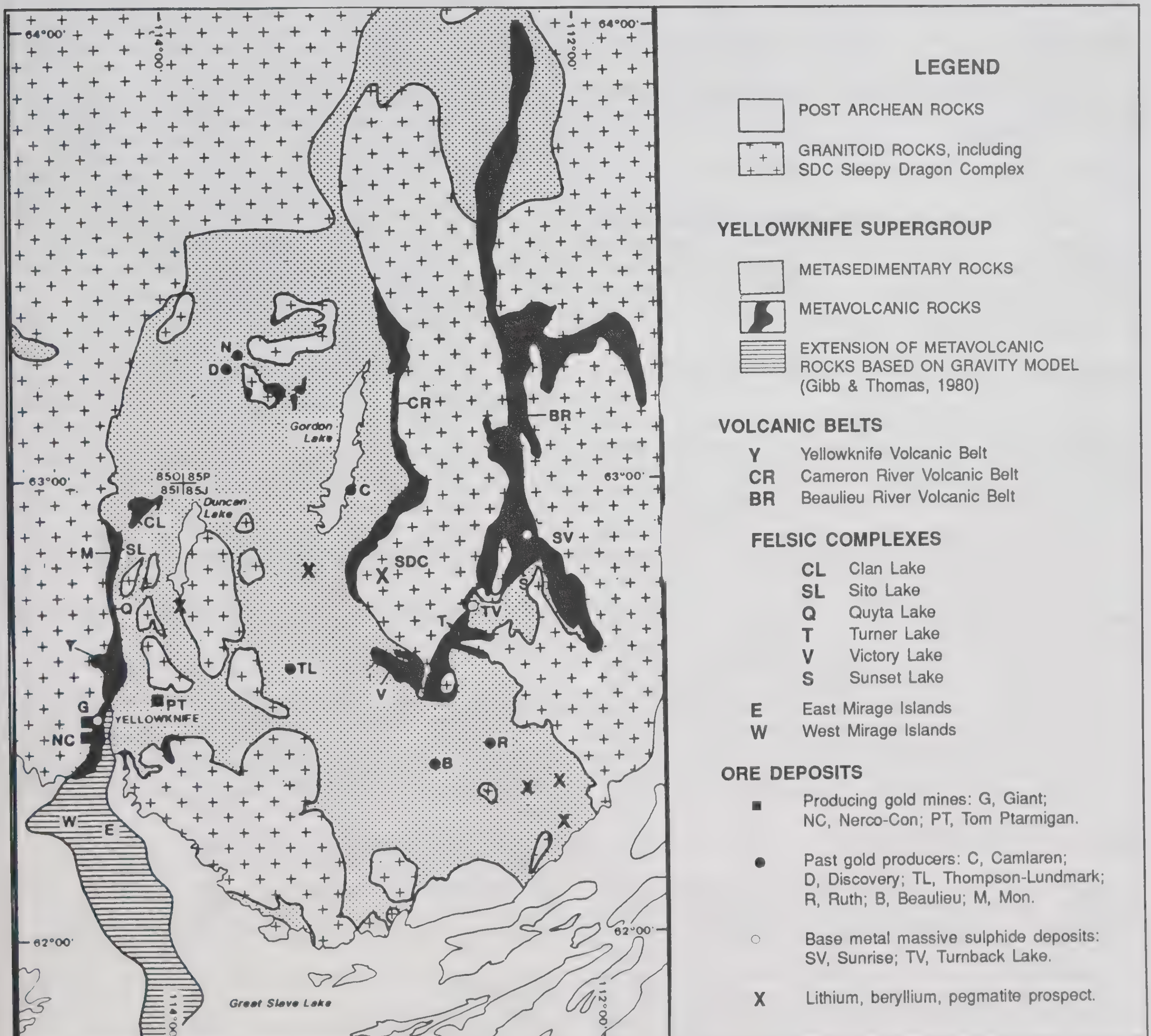


FIGURE 8-56: *Geology and mineral deposits of the Yellowknife supracrustal basin.*

BOSS CLAIMS

Noranda Exploration Co. Ltd. (N.P.L.)	Gold
4 - 2130 Notre Dame Ave.	85 J/16
Winnipeg, Man., R3H 0K1	62°57'N, 114°10'W

REFERENCES

Helmstaedt *et al.* (1985); Henderson (1985); Hurdle (1983, 1984, 1985); Jackson *et al.* (1986); Jolliffe (1939).

DIAND assessment report 082333.

PROPERTY

BOSS 1-9 (4588.71 ha).

LOCATION

The BOSS claim group is about 55 km north of Yellowknife and includes the area around the northern part of Clan Lake (Figs. 8-56, 8-57, 8-58).

HISTORY

Prospecting for gold and silver in the Clan Lake area began in the thirties. In 1964 the Earl Jack Syndicate discovered a gold showing and staked the EL claims which are now covered by BOSS 9. No detailed work was reported on the EL group. BOSS 1-9 were recorded for Noranda Exploration Ltd. between April, 1985 and September, 1986.

DESCRIPTION

The BOSS claims, at the northern end of the Yellowknife volcanic belt, are underlain by Archean Yellowknife Supergroup metavolcanic and metasedimentary rocks (Fig. 8-58; Jolliffe, 1939; Henderson, 1985; Hurdle, 1983, 1984, 1985; Helmstaedt *et al.*, 1985; Jackson *et al.*, 1986c). The supracrustal sequence consists of lower andesitic flows overlain successively by dacitic flows and ash tuffs, volcaniclastic conglomerates, sandstones and pelites, rhyolitic and dacitic ash deposits and upper andesite-basalt intercalated with volcaniclastics and ash fall deposits of the Clan Lake volcanic complex (Hurdle, 1983). The rocks were deformed during two phases of isoclinal folding and during the formation of three regional cleavages, which post-date folding (Hurdle, 1985). The domical structure outlined by volcanic rocks on the NOSE claim group (Fig. 8-58) formed prior to these structures. Metamorphic grade increases to the east and west from a low-grade zone centred along Sito, Clan and Johnston lakes. The north-northeast-trending Yellowknife River fault passes to the west of the BOSS claims.

CURRENT WORK AND RESULTS

In 1985 and 1986 Noranda carried out prospecting and geological, geochemical and airborne geophysical surveys including a 485 line-km Dighem helicopter-borne electromagnetic, resistivity, magnetic and VLF EM survey. Prospecting concentrated on gossan zones and quartz veins along the western margin of the Clan Lake volcanic pile. Several showings were discovered (Fig. 8-58); best assays from BOSS 1 ranged from 73 g/t to 229 g/t Au. The best assays from channel samples on BOSS 1 and 7 are 29.2 g/t Au over 0.8 m, 25 g/t Au over 0.56 m and 3.9 g/t Au over 0.49 m. The EL showing on BOSS 9 was re-examined; one grab sample returned 96.7 g/t Au, 106.3 g/t Ag and 1% Pb (Fig. 8-58). A sulfide-bearing zone along the sedimentary volcanic contact and within the sedimentary unit was outlined by a string of magnetic highs.

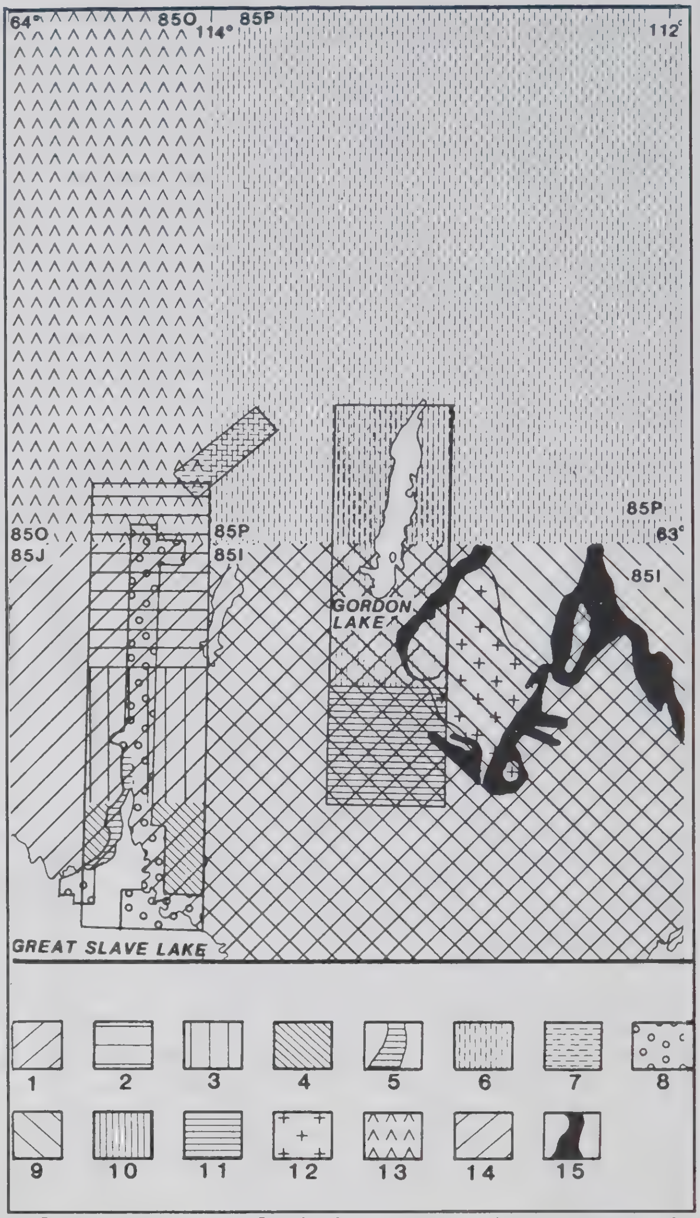


FIGURE 8-57: Geologic maps that cover the Yellowknife supracrustal basin.

TORO CLAIMS

Giant Yellowknife Mines Ltd.	Gold
Bag 3000	85 J/16
Yellowknife, NWT, X1A 2M2	63°51'N, 114°07'W

REFERENCES

Hurdle (1983, 1985).

DIAND assessment reports: 017227, 082358.

Key to Fig. 8-57: Geologic Maps that cover the Yellowknife supracrustal basin

No. Area NTS	Reference	Scale
1. 85 I,J,K,N,O,P	Jolliffe, A.W. (1936), Yellowknife River Area, Northwest Territories. GSC Paper 36-5.	1 in to 8 mi
2. 85 J,0	Jolliffe, A.W. (1939), Preliminary Maps, Quyta Lake and parts of Fishing Lake and Prosperous Lake Areas, Northwest Territories. GSC Paper 39-6.	1 in to 1/2 m
	Jolliffe, A.W. (1940), Quyta Lake and Parts of Fishing Lake and Prosperous Lake Areas, Northwest Territories. GSC Paper 40-14.	
3. 85 J	Jolliffe, A.W. (1946), Prosperous Lake, District of Mackenzie, Northwest Territories. GSC Map 868A.	1 in to 1 mi
4. 85 J	Jolliffe, A.W. (1942), Yellowknife Bay, District of Mackenzie, Northwest Territories. GSC Map 709A.	1 in to 1 mi
5. 85 J/8,9	Henderson, J.F. and Brown, I.C. (1966), Geology, Yellowknife Greenstone Belt, District of Mackenzie. GSC Bulletin 141, GSC Map 1193A.	1:12 000
6. 85 P Carp Lakes	Moore, J.C.G., Miller, M.L., and Barnes, F.Q. (1951), Second Preliminary Map, Carp Lakes, Northwest Territories. GSC Paper 51-8.	1 in to 4 mi
7. 85 O,P	Tremblay, L.P. (1952), Giaque Lake, District of Mackenzie, Northwest Territories, GSC Memoir 266, GSC Map 1017A.	1 in to 2000 ft
8. Yellowknife volcanic belt parts of 85 J/7,8	Helmstaedt, H. *et al.* (1979), Preliminary geology of the southern end of the Yellowknife Greenstone Belt. NWT Geology Div., DIAND. EGS 1979-9.	1:7500
parts of 85 J/9	Hauer, L.M. (1979), Preliminary geology map of the northern end of the Yellowknife Greenstone Belt. NWT Geology Div., DIAND. EGS. 1979-10.	1:8500
85 J/9	Helmstaedt, H. *et al.* (1980), Preliminary geology map of Banting and Walsh Lakes areas. NWT Geology Div., DIAND. EGS 1980-5.	1:8500
85 J/9	Easton, R.M. and Jackson, V.A. (1981), Geology of the Walsh Lake area. NWT Geology Div., DIAND. EGS 1981-3.	1:10 000 1:25 000
85 J/8,9	Easton, R.M. *et al.* (1982b), Geology of the east side of Yellowknife Bay. NWT Geology Div., DIAND. EGS 1982-5.	1:25 000 1:10 000
85 J/15,16	Hurdle, E. (1983), Geology of a Volcanic Pile at Clan Lake. NWT Geology Div., DIAND. EGS 1983-5.	1:25 000 1:10 000
85 J/9,16	Yeo, G.M. *et al.* (1983), Preliminary geology of Quyta Lake area. NWT Geology Div., DIAND. EGS 1983-7.	1:50 000
85 J/16	Helmstaedt, H., *et al.* (1985), Geology of the Sito Lake area. NWT Geology Div., DIAND. EGS 1985-10.	1:10 000 1:20 000
85 J/9,16	Jackson, V.A., *et al.* (1986c), Geology of the Quyta Lake area. NWT Geology Div., DIAND. EGS 1986-2.	1:10 000 1:20 000
85 J/7,8	Relf, C. and Nicolson, D.C. (1986a), Geology of the West Mirage Islands. NWT Geology Div., DIAND. EGS 1986-5.	1:2000
85 J/1,8	Relf, C. and Nicolson, D.C. (1986b), Geology of the East Mirage Islands. NWT Geology Div., DIAND. EGS 1986-15.	1:2000
85 J/8	Brophy, J.A. (1986), Geology of the Lower Crestaurum Formation in the Fred Henne Park Area. NWT Geology Div., DIAND. EGS 1986-13.	1:2000
85 J/7,8	Pelletier, K.S. and Wahlroth, J.M. (1986), Geology of the southwestern Yellowknife Bay area. NWT Geology Div., DIAND. EGS 1986-12.	1:10 000
85 J/8	Roach, D. (1988), Geology of the southeast part of Yellowknife Bay. NWT Geology Div., DIAND. EGS 1988-2.	1:20 000
9. 85 I	Henderson, J.F. and Jolliffe, A.W. (1941), Beaulieu River, District of Mackenzie, Northwest Territories. GSC Map 581A.	1 in to 4 mi
10. 85 P,I	Henderson, J.F. (1941), Gordon Lake, District of Mackenzie, Northwest Territories. GSC 644A and Gordon Lake South, District of Mackenzie, Northwest Territories. GSC Map 645A.	1 in to 1 mi
11. 85 I	Fortier, Y.O. (1947), Preliminary Map, Ross Lake, Northwest Territories. GSC Paper 47-16.	1 in to 1/2 mi
12. 85 I/10,11,14,15	Davidson, A. (1972), Granite Studies in the Slave Province. GSC Paper 72-1A, p109-115 (and unpublished).	1:300 000 (1:50 000)
13. 85 NW	Douglas, R.J.W. *et al.* (1972), Geology of Horn River, District of Mackenzie. GSC Map 1372A.	1:500 000
14. 85 J,I	Henderson, J.B. (1985), Geology of Yellowknife-Hearne Lake area, District of Mackenzie: a segment across an Archean basin. GSC Memoir 414, GSC Map 1601A.	1:250 000
15. parts of 85 I/9, 10,11,14,15,16	Lambert, M.B. (1988), Cameron River and Beaulieu River Volcanic Belts of the Archean Yellowknife Supergroup, District of Mackenzie, Northwest Territories. GSC Bulletin 382.	1:50 000

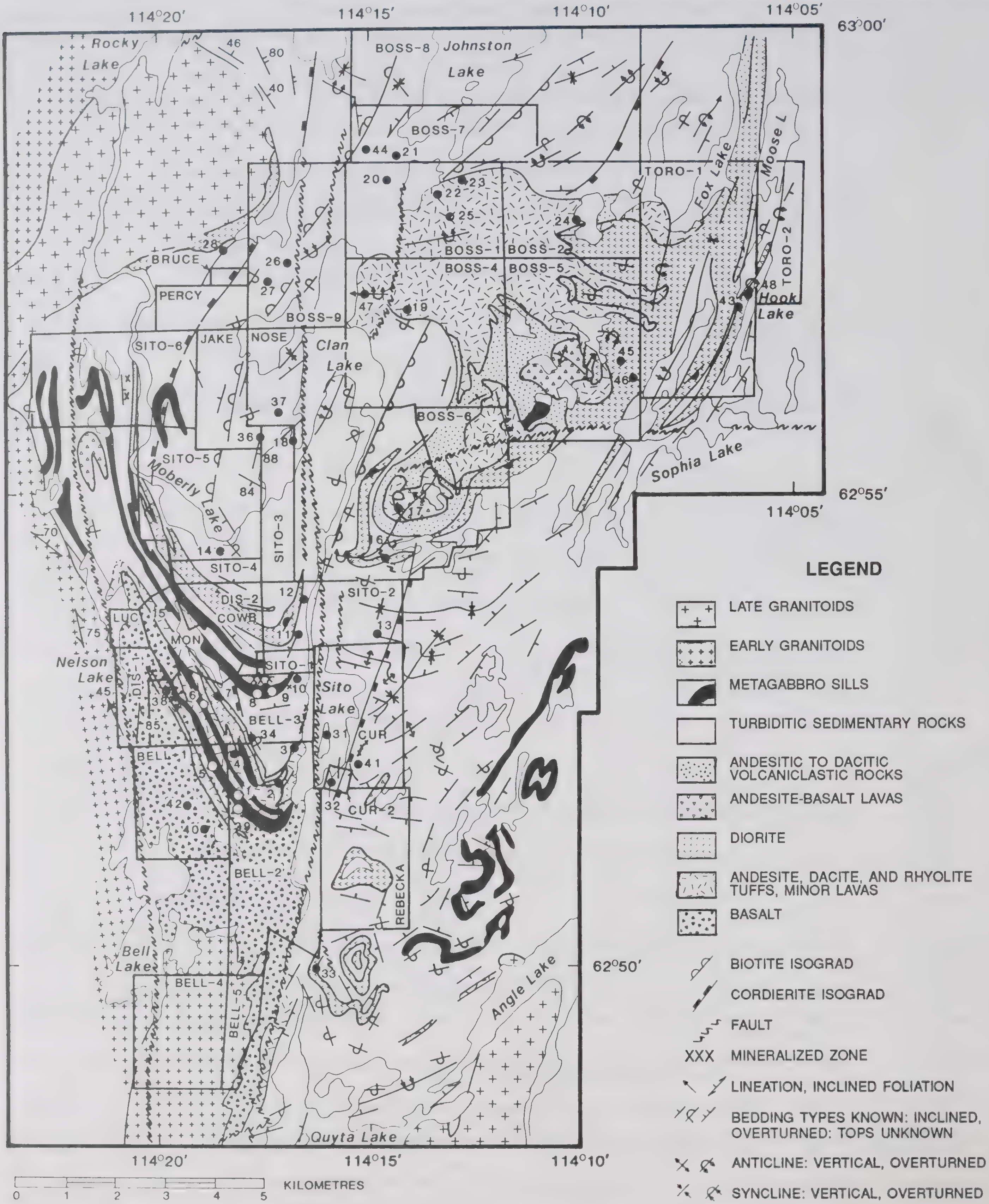


FIGURE 8-58: Geology, showings and claims where 1986-87 work is reported in the northern Yellowknife volcanic belt (Geology modified from Hurdle (1983), Helmstaedt et al. (1985), Henderson (1985) and Jackson et al. (1986c)). (numbers refer to showings listed opposite)

Showing ●	Assay (g/t Au)
1. DEL'S (N)	1.0 to 6.3
2. KOL'S (N)	4.5, 1.6
3. ZONE 1 (N)	80.1, 2.0, 98.6/1 m
4. KOL'S (N)	1.2, 7.6, 2.4
5. KOL'S (N)	10.0
6. OLD TRENCHES	1.3, 30.2
7. LIL 8 LILEX	Au/Ag panned
8. KOL'S (N)	24.7, 2.3, 2.3
9. KOL'S (N)	42.0, 1.9, 42.0, 42.9, 57.3
10. OLD TRENCH	9.9
11. KOL'S (N)	27.6
12. KOL'S (N)	1.3
13. KOL'S (N)	4.1, 3.5
14. COMINCO'S 1930	1.4, 1.7
15. MON (DDH)	0.7, 1.0, V.G. surface showing
16. NOSE (Past Producer)	15.1 kg Au, 3.5 kg Ag from 1035.1 t ore. Grade 14.5 g/t 1964 trench samples up to 189 Au
17. NOSE	Main Showing
18. SUE	3.8/1 m
19. 1985(N)	1.3
20. 1985(N)	73.0
21. 1986(N)	229, 4
22. 1985(N)	1.5, 4.0, 2.9
23. 1985(N)	2.4, 1.1, 89.5, 158.4
24. 1985(N)	2.4, 1.7
25. 1985(N)	1.1, 1.5
26. E.L. (1930)	82.9, 57.3, 3.5
27. E.L. (1930)	131, 97, 18 Au, 1248, 106.3 Ag, 1%Pb
28. COMINCO 1930	1.03
29. COMINCO 1930	3.43
30. COMINCO 1930	12.69
31. CHAS	2.1/0.3
32. CAR	1.7 to 23
33. YK BEAR (1930)	3.1
34. KOL'S (N)	15.6
35. KOL'S (N)	17.2, 12.8
36. JAKE (N)	8.8/1.5 m
37. VICTORY COP, 1947	5.14, 3.8
38. J8B (N)	3.6/1, 2.5/2 m Zone 2
39. ADAM (N)	3.8
40. T-BONE(N)	6.5, 7.8, 6.0
41. CUR/MASON	75
42. P.J.	
43. EARL JACK SYN.-BOULDER 26 g/t	
44. 1985(N)	1.4 g/t Au
45. 1985(N)	2.0, 1.4, 1.1 Au
46. 1985(N)	1.1 Au
47. 1985(N)	2.6 Au
48. EARL JACK SYN	9.3
	(N) - NORANDA

PROPERTY

TORO 1, 2.

LOCATION

TORO 1 and 2 are 55 km north of Yellowknife, covering part of Sophia Lake (Fig. 8-58).

HISTORY

In 1940, high-grade gold-bearing boulders were discovered in the overburden of a northeast-trending linear topographic depression near the northern end of Hook Lake (Fig. 8-58). The quartz-mica schist boulders contain up to 35% sulfides, mainly arsenopyrite and pyrite with minor amounts of pyrrhotite and chalcopyrite. The IVY 1-8 and RIT 1-10 claims covering the float showing was held by a group of Yellowknife prospectors, chiefly Joe Harriman. The ground was optioned in 1945 or 1946 by J. Mason and several short holes were drilled to test the ground under the depression. The property was in good standing until 1963 when it was restaked as the WJ claim group for Earl Jack Syndicate (DIAND assessment report 017227). Geophysical surveys carried out in 1963-64 failed to locate the bedrock source of the boulders but defined one significant conductor within the eastern basaltic unit. This was drilled and assayed, yielding anomalous results for gold and is now covered by TORO 2 claim.

In 1985 the joint venture partners Giant Yellowknife Mines Ltd., Asamera Inc. and Kelmet Resources Ltd. mapped, sampled and prospected the claims. Two grab samples from a 1940 overburden trench assayed 21.39 g/t Au and 10.29 g/t Au. Soil sampling of the trench area yielded from 80 to 800 ppb Au and indicated that the source of the gold-bearing float may be beneath Hook Lake. A rusty, pyritic quartz-sericite zone within rhyodacite tuff was also sampled. Most samples from this zone assayed less than 60 ppb Au, but one sample assayed 95 ppb Au.

DESCRIPTION

The property is underlain by north-northeast-trending metavolcanic and metasedimentary rocks that form the north part of the Yellowknife volcanic belt which includes the distal portion of the Clan Lake volcanic complex (Hurdle, 1983, 1985). Volcanic flows, tuffs, breccias and volcaniclastic rocks range from andesite to basalt and rhyolite to dacite. Sedimentary rocks consist of greywacke, siltstone and pelitic schists. The sequence has been folded about north-northeast-trending isoclines. Sedimentary rocks are cordierite and/or andalusite bearing and volcanic rocks are garnet-amphibole bearing.

CURRENT WORK AND RESULTS

In 1986, Giant Yellowknife completed a 210 line-km Dighem airborne survey and detailed ground surveys over the trench area. Prospecting and sampling was done across the topographic depression as well as the eastern mafic flows and western sulfidic felsic volcanic units, which were also trenched. Boulders were not found within the original trench (which did not reach bedrock), but several found in the surrounding talus were gold bearing. Samples from trenches cut in felsic and mafic volcanic rocks assayed up to 0.17 g/t Au. Samples of iron-stained volcanic and sedimentary rocks collected throughout the area yielded up to 0.685 g/t Au.

SITO PROJECT

Noranda Exploration Co. Ltd. — Gold
4 - 2130 Notre Dame Ave. — 85 J/16
Winnipeg, Man., R3H 0K1 — 62°52'N, 114°15'W

REFERENCES

Helmstaedt *et al.* (1985); Henderson (1985); Hurdle (1983); Jackson *et al.* (1986c); Jolliffe (1942); Little (1985); Yeo *et al.* (1983).

DIAND assessment reports: 017328, 017336, 017431, 019529, 082620.

PROPERTY

BELL 1-5, SITO 1-6, COWB, JAKE, PERCY, BRUCE (4454.9 ha).

LOCATION

The property is 45 km north of Yellowknife, on the west side of the Yellowknife River (Fig. 8-58).

HISTORY

The first claims in the area were the QUYTA claims of Yellowknife Bear Mines Ltd., recorded in 1933, and Cominco's MON claims at Discovery Lake (5 km northwest of Sito Lake), recorded in 1937. The MON gold showing (Figs. 8-56, 8-58), visible gold in quartz veins, is at a metasediment-metagabbro contact. The Victory Cop gold showing, 5 km north-northwest of Sito Lake, was drilled by Beulah Yellowknife Mines Ltd. in 1947. Gold and silver was panned from quartz veins in gabbro at the LIL and LILEX showing, south of Discovery Lake. This showing, now covered by BELL 3, was owned by Oro Plata Mining in the 1930's and by Fairmount Minerals Ltd. in the 1960's. In the 1960's parts of the BELL claims were held as the PJ and JCJ claims. Noranda acquired the BELL claims in 1981. The ground was allowed to lapse in 1983, but was restaked in 1986 and 1987. The SITO 1 claim was recorded in October 1986, while SITO 2-6, COWB, JAKE, PERCY and BRUCE claims were acquired in 1987.

DESCRIPTION

The claims are in the northern part of the Yellowknife volcanic belt (Fig. 8-58; Jolliffe, 1942; Henderson, 1985). The property is underlain by a folded sequence of mafic to intermediate volcanics and minor felsic pyroclastic rocks, quartz porphyry and gabbro intrusions, all of which are overlain by, and to varying degrees intercalated with, turbiditic sedimentary rocks. This sequence represents part of the Sito Lake volcanic complex (Hurdle, 1983; Yeo *et al.*, 1983; Helmstaedt *et al.*, 1985; Little, 1985; Jackson *et al.*, 1986c). The Sito Lake volcanic complex is separated from Clan Lake equivalents by the northern extension of the Hay-Duck Fault. The north-trending Hay-Duck Fault, which is partially defined by a shear zone up to 300 m wide along the west shore of Sito Lake, has left lateral displacement of 4 to 5 km. The amount of vertical displacement is unknown. The Sito Lake fold (Helmstaedt *et al.*, 1985; Little, 1985), a northwest-trending and facing, steeply north-plunging syncline (Fig. 8-58), is the most obvious large scale structure. Small scale basin and dome fold interference patterns in the claim area are manifested in the larger scale Clan Lake dome (Hurdle, 1985) and in sedimentary rocks east of the claim area (Helmstaedt *et al.*, 1985; Little, 1985). Granite to granodiorite is in fault contact with or intrudes mafic volcanics in the western claim area.

A regional metamorphic isograd has been mapped that marks the first appearance of cordierite in metasedimentary rocks. The low-grade metamorphic zone defined by this isograd extends from either side of Sito Lake, northeastward through to Clan Lake and Johnston Lake (Fig. 8-58).

CURRENT WORK AND RESULTS

During June 1987, 1:10 000 scale mapping and sampling were carried out over Noranda's claims and adjacent ground. Several altered and mineralised zones were mapped in detail, those on the BELL claims at 1:5000 scale, and those southwest of Sito Lake at 1:1000 or 1:1250 scale. Dighem flew an airborne geophysical survey, which totalled 754 line-km. A ground magnetic and VLF geophysical survey covered 24 line-km.

Pyrite, marcasite, pyrrhotite, arsenopyrite, galena, chalcopyrite and sphalerite, in decreasing order of abundance, are identified on the property. Seven mineralised zones (Fig. 8-58) have strike lengths of at least 100 m, widths of more than 1 m and assays of greater than 1.0 g/t Au. Of these, six are associated with shear zones in metagabbro that may parallel the axial planes of north-northwesterly F_1, northeasterly F_2 and easterly F_3 folds. In these zones the metagabbro is chloritized, carbonatized and silicified and contains quartz stringers. A porphyritic felsic volcanic unit or hypabbysal intrusion commonly occurs within the mineralised shear zones. Examples of these include Zone 1, Del's, Needle Hill, H-Hill and Adam showings. Zone 1, with a strike length of 500 m and widths of 1 to 12 m, gave assays of 98.6 g/t Au over 1 m, 3.1 g/t Au over 3 m, 2.2 g/t Au over 3 m and 2.2 g/t Au over 4 m.

The Gossan Hill - Fuchsite Hill mineralised zone, developed along north-trending silicified shear zones as well as along the felsic-intermediate volcanic contact, assayed 0.095 g/t Au over 0.5 m. Assays of 4.5 g/t Au and 1.6 g/t Au obtained in 1986 could not be duplicated. Anomalous gold assays were also encountered at the Jake showing in the Moberly Lake area, which is a sheared, silicified and sericitized greywacke containing quartz veins, galena and arsenopyrite stringers and pyrite porphyroblasts. Numerous samples were taken from the Bell Lake and BIF Lake iron formations, but gold content was consistently low.

Examination of the assay results of sulfide-bearing rocks also indicated that: mafic-intermediate volcanics yielded higher gold assays than either felsic volcanic or sedimentary rocks and anomalous gold assays are concentrated close to the regional metamorphic isograd in sheared and altered volcanic rocks.

MON

Cominco Ltd.	Gold
2300 - 200 Granville St.	85 J/16
Vancouver, B.C., V6C 2R2	62°54'N, 114°19'W

REFERENCES

Helmstaedt *et al.* (1985); Henderson (1985); Jackson *et al.* (1986c); Lord (1941); Yeo *et al.* (1983).

DIAND assessment report: 082621.

PROPERTY

The Mon property includes 11 mining leases, MON 3-6, 10, 13-15, 17, 20 and the 31 fraction (202.35 ha) and DIS 1, 2 and 5 claims.

LOCATION

MON and DIS claims are 50 km north of Yellowknife and are centred about Discovery Lake (Fig. 8-58).

HISTORY

In 1937 G.A. Moberly and L.W. Nelson discovered visible gold in quartz veins along the contact between a gabbro sill and sedimentary and volcanic rocks and staked the MON claims under a prospecting agreement with Cominco Ltd. Between 1938 and 1939 eleven trenches were cut along strike to intersect the "Main Vein" or "A" zone and a 19.5 m shaft was sunk and 47 m of lateral development were completed. In 1947, 57.3 m of drilling in 3 holes tested the down-dip extension in the vicinity of trenches 1 and 2. This was followed by 1950 drilling of 4 holes for 360.9 m and in 1961 a magnetic survey was run in an unsuccessful attempt to trace the gabbro-sediment/volcanic contact under Discovery Lake. In 1963 detailed geologic mapping and drilling of 10 holes for 488.9 m tested the southern extension of quartz veining. Between 1965 and 1975 approximately 200 t of vein material was mined by open cut from the "A" zone by R. Stevens under lease with Cominco. A small on-site mill produced a gold-bearing sulfide floatation concentrate.

DESCRIPTION

The property is underlain by the Sito Lake volcanic complex (Figs. 8-56, 8-58), a part of the Archean Yellowknife Supergroup comprising mafic and felsic volcanic, sedimentary and mafic-intermediate intrusive rocks (Yeo *et al.*, 1983; Helmstaedt *et al.*, 1985). These are separated from Clan Lake equivalents by a north-trending left lateral strike-slip fault, the Hay-Duck fault extension along the west edge of Sito Lake. The Sito Lake complex is deformed into a major north-northwest-facing open syncline, the Sito Lake fold (Helmstaedt *et al.*, 1985) that plunges steeply to the north. The MON property is on the west limb of the Sito Lake fold. A cordierite isograd transects the eastern part of the MON claims and DIS 1, separating medium-grade rocks to the west from low-grade rocks to the east.

The main MON showing has been described by Lord (1941). The quartz vein system parallels the north-northwest-trending contact between a gabbro sill and sedimentary-volcanic rock but locally the vein or a splay will extend 3 m into the enclosing wedge of volcanic and sedimentary rock. Veins within the system are podiform or lens shaped. Quartz is glassy and varies from white to grey in colour. The vein system has been traced 213 m along strike and by drilling to depths of less than 30 m. Vein width varies from less than 10 cm to about 3 m and averages 0.6 to 0.9 m. Gold content is erratic, ranging from trace up to 274 g/t Au and averages about 34 g/t Au. Quartz veins contain up to 50% ragged, silicified wall rock fragments, which are locally sulfide rich. Quartz veins usually contain less than 1% sulfides and rarely up to 5% sulfides, which are, in decreasing order of abundance, pyrite, pyrrhotite, arsenopyrite, chalcopyrite, galena and sphalerite. Visible gold is common and a correlation is indicated between gold grade and sulfide content.

CURRENT WORK AND RESULTS

In 1986 Troymin Resources Ltd. acquired from Cominco and others an option to purchase the MON property. In January 1987 Troymin drilled 11-holes, 484 m, to test the southern extent of the quartz veining and staked additional claims, DIS 1, 2 and 5, in February 1987. In fall 1987 Coronado Resources Inc. entered into a joint venture agreement with Troymin. Many of the earlier drilled holes stopped short of intersecting the quartz veining and failed to correlate quartz vein lenses. During November-December 1987 12 holes were drilled by Coronado to test strike and dip extensions of the veining. Results of this drilling indicate the Main vein may not have depth continuity, but other mineralised veins were discovered and these remain open both at depth and along strike.

CUR, REBECKA

J.D. Mason	Gold
Yellowknife Gold Mines	85 J/16
321 Bellanca Ave.	62°52'N, 114°15'W
Yellowknife, NWT, X1A 1W8	

REFERENCES

Helmstaedt *et al.* (1985); Henderson (1985).
DIAND assessment reports: 081823, 082618.

PROPERTY

CUR and REBECKA (982.8 ha).

LOCATION

The claims are on the southeast corner of Sito Lake, 50 km north of Yellowknife (Fig. 8-58).

HISTORY

The CUR 1 and 2 claims were recorded in March 1981 and REBECKA in June 1987.

DESCRIPTION

The property is underlain by Burwash Formation greywacke-mudstones, at the north end of the Yellowknife volcanic belt (Henderson, 1985; Helmstaedt *et al.*, 1985). North- to northeast-trending mafic and felsic dykes, up to 6 m wide and tens of metres in length, intrude the metasedimentary rocks. A northeast-trending regional metamorphic isograd transects the claim area, separating low-grade metasediments to the west from medium-grade, cordierite-bearing equivalents to the east (Fig. 8-58).

Highly sheared volcanic rocks along the Yellowknife River mark the northern extension of the Hay-Duck Fault (Fig. 8-58). A small pyritic shear zone in the south-central part of the CUR claim may be a subsidiary shear associated with this fault.

CURRENT WORK AND RESULTS

In September 1987 chip and channel samples were collected from trenches that were excavated over two zones. In Zone 1 silicified greywacke and argillite contain disseminated arsenopyrite and pyrite and are cut by numerous quartz veins and stringers. Arsenopyrite content increases to up to 20% and is locally massive within and near quartz veins. A sample of massive arsenopyrite assayed 18.4 g/t Au over 1.5 m. Gold content throughout the trenches is erratic. Zone 2 consists of silicified metasedimentary rocks intruded by a pink felsic dyke. The dyke contains 1 to 5% combined sulfides and hematite and yielded low gold assays.

WALSH LAKE PROPERTY

Kelmet Resources Ltd. — Gold
310, 441 5th Ave. SW — 85 J/9
Calgary, Alta., T2P 2V1 — 62°37'N, 114°17'W

REFERENCES

Easton and Jackson (1981); Helmstaedt *et al.* (1980); Lord (1941, 1951); Seaton *et al.* (1985, 1987).

DIAND assessment reports: 017330, 017373, 017422, 061422, 080251, 080741, 081393, 081897, 082089, 082508, 082796.

PROPERTY

TING 1,2,4; WAL 1,2,3,10; EQUINOX 1-2; and KELLY 1,2 (2266.3 ha).

LOCATION

The claims are north of Yellowknife and cover Banting, Jackson, and Walsh lakes (Fig. 8-59). The property is accessible by road and boat, via either Vee Lake or by portage from Prosperous Lake.

HISTORY

The area has been explored since the early 1930's. The exploration history of the claims is described by Lord (1941, 1951) and in the various DIAND assessment reports listed under REFERENCES. Parts of the present claims were previously held as the NIB and SAMEX groups. Gold showings discovered in the 1940's in the northern part of the property were trenched and drilled to depths of less than 30 m. Although gold values were confirmed the area has since received only sporadic attention.

The WAL 1-15 claims were recorded by W.J. Humphries in 1974. Four were taken to lease in 1984. The TING and EQUINOX claims were staked by W.J. Humphries in 1983.

In 1985 Kelmet Resources Ltd. optioned the TING, WAL and EQUINOX claims from W.J. Humphries and mapped, prospected and sampled (Seaton *et al.*, 1985). KELLY 1 and 2 were staked in 1985.

DESCRIPTION

Metavolcanic and metasedimentary rocks on the claims form part of the Yellowknife volcanic belt. Volcanics are Banting Group ash and crystal tuffs, tuff breccias and sub-volcanic mafic intrusives and intercalated thin, mafic to intermediate flows and volcaniclastic sediments. Sediments are Walsh Formation argillite, graphitic and pyritic schists and thin-bedded argillaceous greywacke and overlying turbidites (Helmstaedt *et al.*, 1980; Easton and Jackson, 1981). The volcanics and sediments comprise an east-facing north-trending homoclinal succession dipping steeply east. The homocline is separated from the main basic volcanic assemblages of the Yellowknife greenstone belt by major north-trending faults.

Gold showings discovered on the claims are indicated on Figure 8-59. Most of these showings are associated with conformable sulfide-bearing (arsenopyrite, pyrite, chalcopyrite, sphalerite and pyrrhotite) and/or quartz-bearing schist zones, and are developed in four main geological settings:

1. silicified and carbonatized schist within cherty felsic tuffs (Samex, Samex North and Sam Otto showings).
2. silicified and cherty lenses in pyritic sediments (Nib Central showing).
3. stratigraphic transition zones between Banting Formation felsic tuffs and Walsh Formation graphitic and pyritic argillites (Nib North showing).
4. chlorite/sericite schist zones within Walsh Formation argillaceous greywacke (Mispickle Island showing).

CURRENT WORK AND RESULTS

In 1986 the volcanic-sediment interface within the TING, WAL and EQUINOX-1 claims was mapped and showings, gossans, anomalous rusty zones and sulfide-bearing quartz veins were sampled. A total of 225 rock and 12 soil samples were collected and assayed for gold and all analysis over 1000 ppb Au were fire assayed. Gold content ranged from trace to 12.5 g/t Au.

Results from this work indicated that:

1. sulfide minerals, gossan development, silicification and epigenetic quartz veins, stockwork and lenses are developed in several apparently stratigraphically continuous zones.
2. the distribution of anomalous gold concentrations (greater than 50 ppb Au) appears to be stratigraphically controlled.
3. Nib Central, Ting, Mispickle North and Mispickle showings are stratigraphically contiguous and sulfide content and gold tenors may increase in the metasediments towards the south.
4. a stratiform zone of anomalous gold values is found within the felsic volcanics of the Banting Formation.

During February 1987, Taiga Consultants of Calgary were contracted to carry out a magnetic and VLF EM survey (DIAND assessment reports: 082508, 082796). Two grids covering parts of EQUINOX 1-2 were established on the ice and tied into a land grid. The zones of iron-rich pelites, which are exposed on land along the volcanic-sediment interface, were defined by magnetic and EM surveys and these were extended from the Mispickle showing southward under Walsh Lake. During summer 1987 the remainder of the north half of the property was mapped at 1:5000 scale and 700 soil samples were collected for gold and arsenic assay.

PRO CLAIMS

Nathan Minerals Inc. — Gold
18, 10509 81 Ave. — 85 J/8,9
Edmonton, Alta., T6E 1X7 — 62°34'N, 114°15'W

REFERENCES

Baragar (1961); Easton and Jackson (1981); Helmstaedt and Padgham (1986); Helmstaedt *et al.* (1980); Jolliffe (1938); Lord (1941, 1951); McGlynn (1971); Seaton *et al.* (1987).

DIAND assessment reports: 081835, 082040, 082152, 082602.

PROPERTY

PRO 2-11 (5260.5 ha).

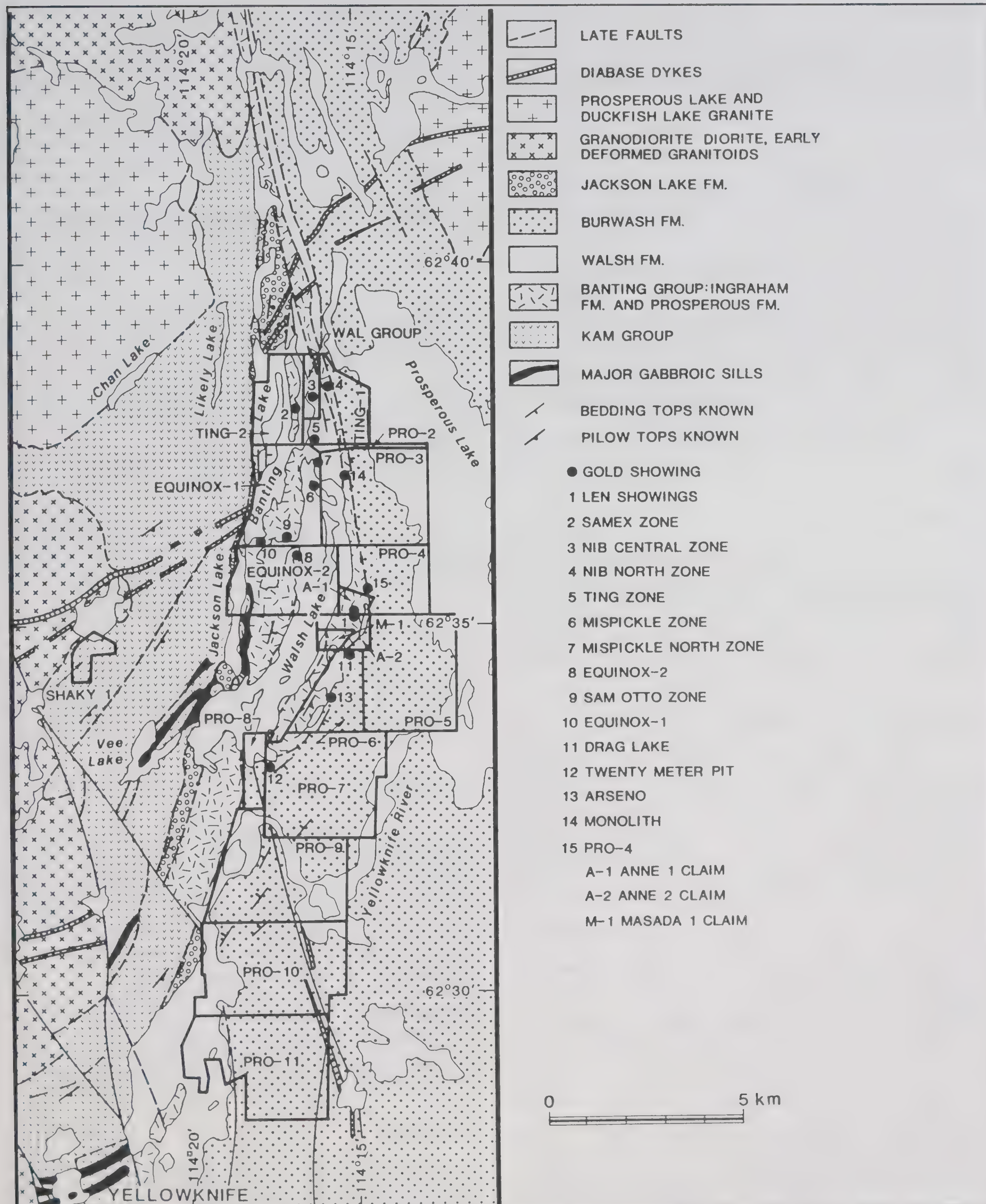


FIGURE 8-59: Geology, showings and claims in the Walsh Lake area (modified after Helmstaedt and Padgham, 1986).

LOCATION

The property covers the area between Walsh Lake and Prosperous Lake, extending from north of Burwash Point on Yellowknife Bay, to near the north end of Prosperous Lake, about 19 km north of Yellowknife (Fig. 8-59).

HISTORY

The history of exploration in the claims area is described by Baragar (1961), Jolliffe (1938), Lord (1941, 1951), McGlynn (1971) and in DIAND assessment reports listed under REFERENCES. An extensive gossan in the northwest corner of PRO 7 was staked as the BELL-MURPHY group in 1928. It was staked again as the LEN group in 1957 and a shallow trench excavated by the previous owners, now known as the Twenty Metre Pit, was deepened to 2.4 m. Four samples collected by Baragar (1961) yielded assays of trace to 0.17 ppm Au Noranda restaked the gossan in 1977 as the LAW claims. PRO 3-7 were recorded in May of 1983, PRO 8 was added in August 1984 and PRO 9-10 and PRO 11 were recorded in May and August 1986, respectively. PRO 2 was recorded in September 1987.

Work carried out on PRO 3-8 (DIAND assessment reports: 081835, 082040) during 1984 and 1985 is summarised in Seaton *et al.* (1987).

DESCRIPTION

The claims are underlain by Banting Group felsic to intermediate volcanic rocks and Duncan Lake Group sedimentary rocks and intercalated volcanic rocks of the Yellowknife volcanic belt (Fig. 8-59; Helmstaedt and Padgham, 1986). Considerable amounts of sulfides were noted by Helmstaedt *et al.* (1980) along the volcanic-sediment contact, which is marked by interbedded volcanics and argillite.

CURRENT WORK AND RESULTS

During 1986 and 1987 geological mapping at 1:4000 scale, rock sampling and biogeochemical surveying, which included analysis of humus and labrador tea twigs, was completed.

Results from this work include:

1. The zone of sulfide mineralisation near the Prosperous-Burwash formation contact, observed in 1985, extends through PRO 3 and 4 claims (Fig. 8-59). Samples collected along this zone contained up to 8100 ppm As and from 59 to 907 ppb Au.
2. A small pit about 50 m east of the Arseno showing (Fig. 8-59) contains an arsenopyrite-bearing quartz vein which assayed 24 ppb Au over 2.5 m. Rusty metasediments about 150 m to the south of this pit assayed 158 ppb Au over 5 m.
3. Samples from the Drag Lake (Fig. 8-59) showing assayed up to 2.5 g/t Au. Samples from other arsenopyrite showings within quartz veins assayed up to 1.6 g/t Au.
4. Some samples of tuffaceous slates within the Prosperous Formation near the southeast end of Walsh Lake are anomalous in Au and As.
5. Background concentrations of platinum, palladium and gold are present in the Duck Lake Sill.
6. Chip samples of quartz veins in Walsh Formation argillites, from a pit on an island near the north end of Walsh Lake, yielded 459 ppb Au, 10 000 ppm As and 174 ppm Cu.

ANNE CLAIMS

Richard Zabo[illegible]av	Gold
P.O. Box 1953	85 J/09
Yellowknife, NWT, X1A 2P5	62°35'N, 114°15'W

REFERENCES

Baragar (1961); Easton and Jackson (1981); Helmstaedt *et al.* (1980).

DIAND assessment reports: 081375, 081642, 082072.

PROPERTY

ANNE 1-2 (157 ha).

LOCATION

The claims are roughly 16 km north of Yellowknife on the east shore of Walsh Lake and west of the PRO claims (Fig. 8-59).

HISTORY

In 1961, the property was held by Fred Lypka and Len Peckham as the LEN group (Baragar, 1961). Three trenches were excavated in 1980-82 (DIAND assessment reports: 081375, 081642). ANNE 1-2 were recorded in August, 1984.

DESCRIPTION

The claims cover the northerly trending contact between intermediate to felsic volcanics of the Banting Group to the west and metaturbidites of the Burwash Formation to the east (Fig. 8-59; Easton and Jackson, 1981; Helmstaedt *et al.*, 1980).

CURRENT WORK

Work done in 1985 is described here because it was filed after the publication of the 1984-85 Mineral Industry Report. In 1985 one day was spent evaluating the property. Samples collected from existing pits and trenches were examined under the binocular microscope and described. Four samples collected from four pits were assayed for gold and silver. The best assay was 6.9 ppm Au and 7.5 ppm Ag. The property was optioned to Nathan Minerals in 1987.

MASADA 1

Roger Windle	Gold
Box 2905	85 J/9
Yellowknife, NWT, X1A 2R2	62°33'N, 114°15'W

REFERENCES

Easton and Jackson (1981); Helmstaedt *et al.* (1980); Helmstaedt and Padgham (1986).

DIAND assessment reports: 082072, 082490.

PROPERTY

MASADA 1.

LOCATION

MASADA 1 is on the east shore of Walsh Lake, south of the ANNE claims, about 13 km north of Yellowknife (Fig. 8-59).

HISTORY

The property was part of the ANNE claim group (DIAND assessment report 082072).

DESCRIPTION

The claim is underlain by upper Banting Group felsic to intermediate volcanics of the Archean Yellowknife Supergroup; to the east are sedimentary rocks of the Burwash Formation (Helmstaedt and Padgham, 1986).

CURRENT WORK AND RESULTS

In June 1987 two trenches were blasted in the northwest corner of the claim. Two samples assayed 2 and 14 ppb Au.

SHAKY 1

J.B. MacAlister	Gold
P.O. Box 322	85 J/9
Fort Langley, B.C., V0J 1J0	62°35'N, 114°22'W

REFERENCES

Helmstaedt and Padgham (1986); Henderson (1985); Henderson and Brown (1966); Seaton (1983).
DIAND assessment report: 082505.

PROPERTY

SHAKY 1.

LOCATION

The claim is on the south shore of Ryan Lake, about 13 km north of Yellowknife (Fig. 8-59).

HISTORY

The property covers ground that originally was part of the ANN 1-10 claims, staked by D. Nickerson in 1971 (Seaton, 1983). In the southern part of these claims a northeast-trending shear zone up to 1.5 m in width was mapped. A quartz vein less than 13 cm wide in this shear zone yielded erratic but locally high gold assays. In 1984, 14 t of material was mined from this vein and treated at Con Mine. The grade of this test was 37.3 g/t Au.

DESCRIPTION

The claim is underlain by Kam Group basalts of the Yellowknife volcanic belt (Helmstaedt and Padgham, 1986; Henderson and Brown, 1966). To the west of the claims the volcanic rocks are intruded by the Western Granodiorite.

CURRENT WORK AND RESULTS

During September 19-21, 1987, 32 rotary holes were drilled, totalling 9.8 m. Drill cuttings were panned and 4 composite samples were assayed. Assays ranged from 2 to 116 ppb Au.

MARLIN CLAIMS

Golden Marlin Resources Ltd.	Gold
Suite 300, 133 3rd Ave. N	85 J/1,7,8
Saskatoon, Sask., S7K 2H4	62°18'N, 114°28'W

REFERENCES

Baragar (1966); Boyle (1961); Gibb and Thomas (1980); Helmstaedt *et al.* (1979); Helmstaedt and Padgham (1986); Henderson (1970, 1975b, 1976, 1978); Henderson and Brown (1966); Jolliffe (1942, 1946); Relf and Nicholson (1986); Seaton (1983a); Seaton *et al.* (1987); Seaton and Hurdle (1978).
DIAND assessment reports: 082491, 082492, 082493, 082404, 082496, 082506, 082613, 081871, 081872, 081873.

PROPERTY

MARLIN 1-34.

LOCATION

The claims are 10 to 25 km south of Yellowknife and cover much of the outer part of Yellowknife Bay, including the West Mirage and many of the East Mirage islands.

HISTORY

The northern part of the Marlin claim block was, in part, previously staked as the YT group, the history of which is summarised in Seaton (1983a) and Seaton and Hurdle (1978). MARLIN 1-10 were recorded in 1982 and MARLIN 14-28 and 29-31 were added in 1984 and 1985. During 1984, work included geological mapping, prospecting, sampling, including underwater sampling using scuba equipment, and marine surveying. Gold showings were discovered. In 1985, work comprised an IP survey over lake ice, overburden drilling, additional water-borne seismic surveying, aerial photography and a helicopter-borne magnetic and VLF EM survey.

DESCRIPTION

The MARLIN claims cover an area of Great Slave Lake at the mouth of Yellowknife Bay where the islands represent the southern limit of outcrop of the Yellowknife volcanic belt (Helmstaedt *et al.*, 1979; Relf and Nicholson, 1986a,b).

CURRENT WORK AND RESULTS

During 1986 and 1987, 615.5 km of seismic surveys at 50 m line spacing were completed to help delineate shear structures including the southern extension of the Campbell shear zone and the West Bay Fault. Prospecting on the land parts of claims included panning for gold and recording the corresponding colours. Samples from each panning site were taken and assayed for gold and silver.

BRANDY, MONTE, LOIS, KEN and JOON Claims

Golden Exodus Ventures Ltd. — Gold
600, 890 W. Pender St. — 85 I/7
Vancouver, B.C., V6C 1K4 — 62°25'N, 112°55'W

REFERENCES

Lord (1951); Seaton *et al.* (1987).
DIAND assessment reports: 082086, 062263, 062175, 060059, 081798, 081830, 082087.

PROPERTY

MONTE 4-6, BRANDY 1, LOIS 1-2, KEN 1, JOON 2.

LOCATION

The claims are near Strike Lake, 80 km east of Yellowknife.

HISTORY

Ground staked in 1939 as the NORMA 1-12 claims is covered now by BRANDY 1. The history of the NORMA claim group is covered in detail by Seaton *et al.* (1987). JOON 2 was staked in 1939 for Consolidated Mining and Smelting. Diamond drilling was done in 1941, 1956 and 1973. In 1977 and 1978, Strike Lake Resources Ltd. optioned the JOON 2 claim from D. Nickerson and conducted trenching and bulk sampling. Bulk sample grades averaged 171.4 g/t Au. The JOON 2 claim was optioned to Robertson Investments Ltd. from D. Nickerson in 1980 and 20 t of material were shipped to Vancouver for milling and metallurgical testing. In 1984, two holes were drilled on BRANDY 1 to confirm grades reported by Beaulieu Yellowknife Mines Ltd. in the mid-1940's.

DESCRIPTION

The claims are underlain by Burwash Formation, greenschist-grade, thinly to thickly bedded metaturbidites that are intricately folded. The auriferous grey-white quartz veins are parallel to bedding and are concomitantly folded. The Norma Vein, on BRANDY 1 claim, is described in detail by Lord (1951).

CURRENT WORK AND RESULTS

In 1985 Taiga Consultants Ltd. on behalf of Genesis Resources Corporation (now Golden Exodus Ventures Ltd.) prospected the claims. Existing trenches were mapped at 1:250 and chip sampled. Assays ranged from 11.04 to 256.63 g/t Au and 15.86 to 32.66 g/t Ag, over narrow widths. Soil geochemical, magnetometer and VLF EM surveys were conducted over four separate flag-and-compass grids. Three anomalous gold assays were recorded. The VLF EM survey delineated 4 conductors, one of which corresponded to a magnetic low and the magnetometer survey defined a number of narrow magnetic zones.

JPAG 1-3 CLAIMS

Goldbrook Explorations Inc. — Gold
500, 67 Richmond St. W — 85 I/4
Toronto, Ont., M5H 1Z5 — 62°10'N, 113°50'W

REFERENCES

Henderson (1985); Padgham *et al.* (1976).
DIAND assessment report: 082180.

PROPERTY

JPAG 1-3.

LOCATION

The claims cover the Benign Islands in the North Arm of Great Slave Lake, 42 km west of Yellowknife.

HISTORY

Early work is not recorded. In 1962, Giant Yellowknife Mines Ltd. mapped and sampled trenches in quartz-gold veins on the islands. Terra Mining and Exploration Ltd. staked the BEN 1 claim in 1969 and explored by trenching. In 1973, the BEN 2-9 claims were added and 2 holes were drilled for 43 m to test a quartz vein system (Padgham *et al.*, 1976). The BEN claims had all lapsed by 1979. The JPAG 1-3 were staked in 1986.

DESCRIPTION

The claims are underlain by steeply northeast-dipping metaturbidites of the Burwash Formation.

CURRENT WORK AND RESULTS

A 50 km grid was established over the showings on the property and magnetic and VLF EM surveys were completed.

RAND Claims

BHP-Utah Mines Ltd. — Gold
1600 - 1050 W. Pender St. — 85 J/8
Vancouver, B.C., V6E 3S7 — 62°27'N, 114°05'W

REFERENCES

Henderson (1985); Jolliffe (1942).
DIAND assessment report: 082363.

PROPERTY

RAND 1-5.

LOCATION

The property is centred on Preg Lake, 13 km east of Yellowknife.

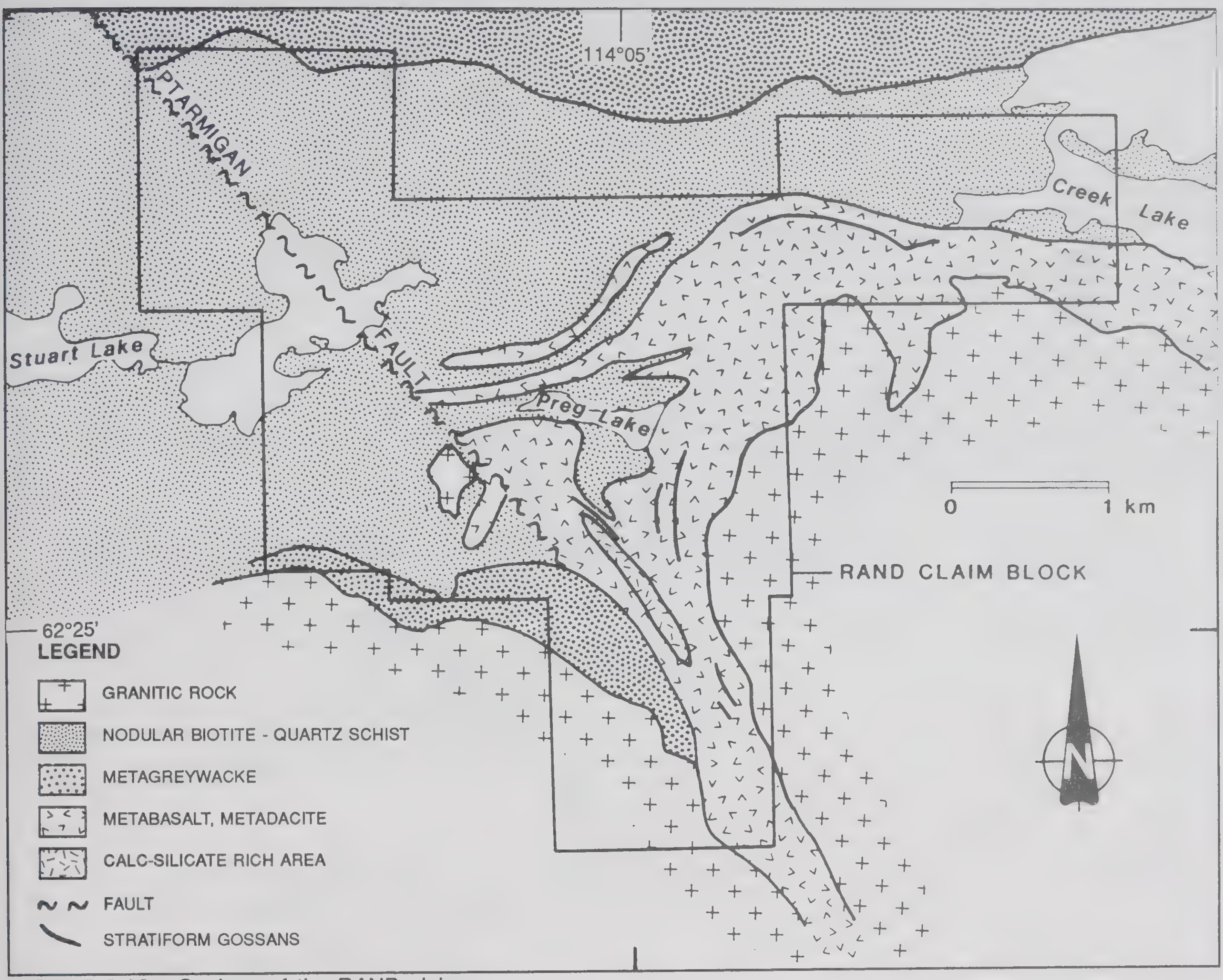


FIGURE 8-60: *Geology of the RAND claims.*

HISTORY

Previous exploration is evidenced by claim posts, pits, trenches and X-ray drill core; however, no assessment work was filed. RAND 1 was staked on August 31, 1985, and RAND 2-5 were added in December, 1985.

DESCRIPTION

The RAND claims cover the western part of a 10 km by 1 km arcuate belt of Archean mafic flows, the Duck Formation, part of the Yellowknife Supergroup, paralleling the contact with a granodioritic pluton to the south and east (Figs. 8-56, 8-60; Henderson, 1985). The metavolcanics are conformably overlain to the north by greenschist- to amphibolite-grade greywacke and argillite of the Burwash Formation (Henderson, 1985). Quartz-feldspar porphyry dykes, diabase dykes and quartz veins cut all lithologies. There are several northwest-trending, steep-dipping faults, including the Ptarmigan Fault, on the property.

CURRENT WORK AND RESULTS

Field work in 1986 included 1:5000 scale geological mapping, rock-chip sampling, and ground VLF EM and magnetometer surveying along a cut and chained grid with cross-lines at 100 m or 200 m intervals.

Several stratiform, siliceous, amphibolitic gossanous zones with pyrrhotite, pyrite and chalcopyrite in the volcanics were traced for 200 m to 800 m (Fig. 8-60). Most have VLF EM and/or magnetic signatures which reflect the coincidence of shearing and pyrrhotite. No samples assayed were anomalous in gold, although some contain arsenic, tungsten and base metal anomalies. An extensive zone of calcsilicate enrichment in the mafic volcanics is strongly anomalous in arsenic and sporadically anomalous in tungsten (Fig. 8-60). Rock chip samples of quartz veins assayed up to 1750 ppb Au.

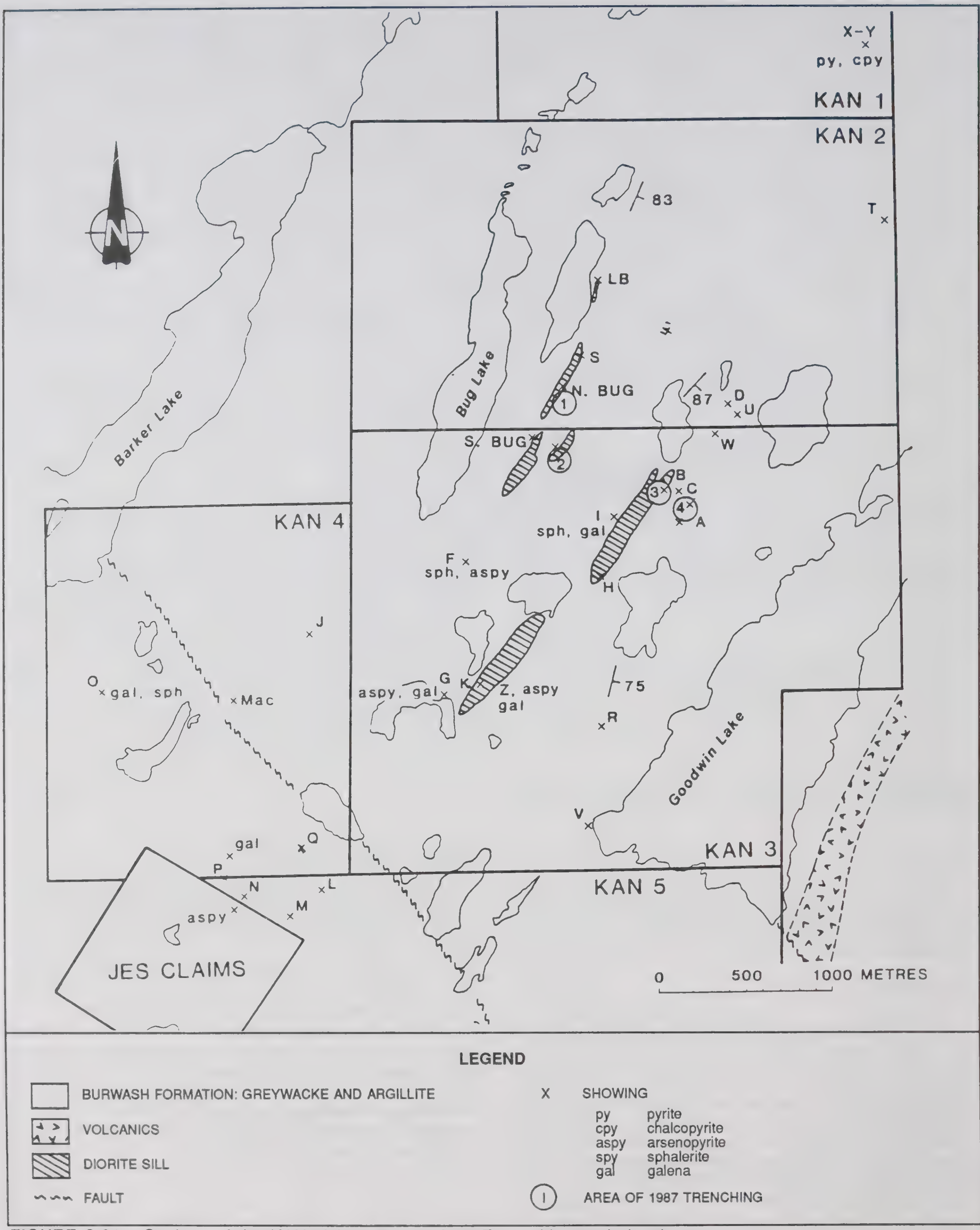


FIGURE 8-61: *Geology of the KAN claims, areas of 1987 trenching and showings.*

KAN 1-5

Kansai Mining Corp.	Gold
1110 - 625 Howe St.	85 O/1
Vancouver, B.C., V6C 2T6	114°07'N, 63°03'W

REFERENCES

Lord (1951); Seaton (1984); Thorpe (1966, 1972); Tremblay (1952).
DIAND assessment report: 082852.

PROPERTY

KAN 1-5.

LOCATION

The claims are north of Johnson Lake, 67 km north of Yellowknife, 25 km southwest of Discovery Mine.

HISTORY

Exploration in the area dates back to the 1930's. In 1938 the ground was held as the BON, TON and ALP claim groups and trenching was completed on a mineralised diorite sill. Production is reported in 1938 or 1939 from the adjacent J.E.S. claims (Fig. 8-61; Seaton, 1984). The property was restaked as the CAR and KEL groups in 1944 and following discovery of the Discovery mine, prospecting, trenching and small core drilling were completed between 1945-1947 on the BUG group. During 1981 underground exploration was completed on the Main or Cross vein on the J.E.S. claims adjoining KAN 4. The KAN 1-5 were staked in 1987.

DESCRIPTION

North- to northeast-striking, isoclinally folded, massive siliceous to argillaceous greywackes and minor argillites of the Burwash Formation are intruded by quartz-diorite sills. Several quartz veins contain anomalous gold concentrations and associated minerals include arsenopyrite, pyrrhotite, pyrite, galena and sphalerite. The largest sill, up to 150 m wide with a 2 km strike length, is cross-cut by mineralised quartz veins in tension gashes, locally at its contact with sediments, and in local stockworks. Quartz veins contain disseminated pyrrhotite and arsenopyrite with minor pyrite and galena and gold.

CURRENT WORK

Ten trenches were excavated in four areas (Fig. 8-61) to test quartz veins in diorite sills and sediments. Thirty six grab and channel samples were collected for assay. Samples from new trenches on the North Bug showing assayed from 1 to 4.9 g/t Au. The best assay, 27.8 g/t Au, came from a grab sample on the F showing.

NICHOLAS LAKE

Chevron Minerals Ltd.	Gold
1900 - 1055 W. Hastings St.	85 P/4,5
Vancouver, B.C., V6E 2E9	63°15'N, 113°45'W

REFERENCES

Moore *et al.* (1951); Tremblay (1952).
DIAND assessment report: 062301, 060410, 082655.

PROPERTY

NIC 1 and 2.

LOCATION

The claims are 88 km north-northeast of Yellowknife and the main showing is on the north side of Nicholas Lake, 10 km north of Discovery mine (Fig. 8-56).

HISTORY

A mineralised vein system cross-cutting metasediments was discovered in 1941 and staked as the BENCH claims. Cominco blasted 14 trenches in 1941 and drilled 10 X-ray holes in 1947. These claims lapsed in 1952. The area was restaked in the late 1950's as the DOT 1-6 group by Archie Mandeville, then as the Bag 1-6 by Fred Lypka in the 1960's, and as the GAB 1-6 group by Robert Olexin in the 1970's. Seven trenches were blasted by these owners.

The main showing area was staked in 1986 as the NIC 1 claim (129 ha) by David Webb, and together with the adjoining NIC 2 claim, was optioned by him to Chevron Minerals Ltd. in April 1987.

DESCRIPTION

Burwash Formation of the Archean Yellowknife Supergroup comprises thinly to thickly bedded greywacke turbidites with cordierite porphyroblasts replacing the more argillaceous layers. These are intruded by granititic bodies (Fig. 8-62). The main showing is within a 300 m by 150 m foliated biotite granodiorite plug near the contact with sediments.

The main showing, a zone of sulphide-bearing quartz veins, is exposed over a width of 5 m and a length of 160 m. The zone is sinuous with a 130° strike. Sulphides are arsenopyrite, pyrite, chalcopyrite, sphalerite, galena and pyrrhotite. Quartz may be glassy, cherty or sugary. Gold is associated with the latter two.

CURRENT WORK AND RESULTS

Three days were spent in geological mapping at 1:10 000. The vein system was mapped at 1:500 along a cut and flagged grid. The 15 old and 4 new trenches were mapped at 1:20 or 1:25 and chip sampled. This was followed by stripping, mapping at 1:250, and additional chip sampling (Fig. 8-63).

HEATHER, PETE, BILL AND RON CLAIMS, SPARTA VEIN (TINKER LEASE) and GAB PROPERTY

Treminco Resources	Gold
110 - 625 Howe St.	85 P/3,4
Vancouver, B.C., V6C 2T6	63°05'N, 113°30'W

REFERENCES

Henderson (1941); Lord (1951); Padgham (1985).
DIAND assessment reports: 060410, 082647.

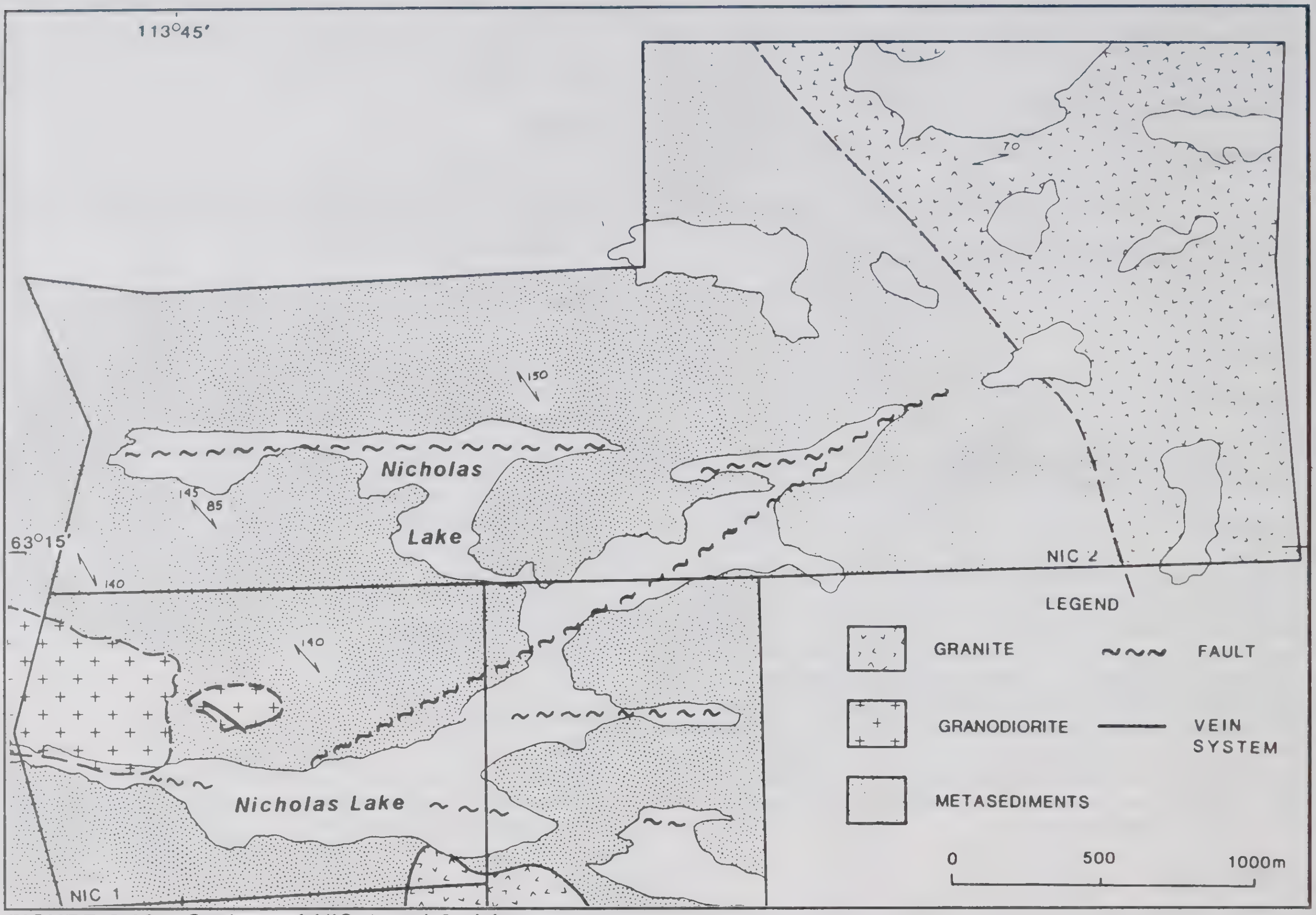


FIGURE 8-62: Geology of NIC 1 and 2 claims.

PROPERTY

HEATHER 1, HEATHER 2, PETE 1, BILL 1, RON 1, TINKER and GAB leases.

LOCATION

The property is 80 km northeast of Yellowknife on Cross and Mac lakes between Gordon and Thistlethwaite lakes.

HISTORY

The Sparta vein was first staked in 1945. Trenching and diamond drilling for 3046 m of core in 76 holes was completed in 1946. In 1947 gold was discovered on the GAB property and drilling, totalling 396 m in 41 holes, was completed. Drilling has defined a 60 m length of vein averaging 19.89 g/t Au (uncut) across 1.2 m to a maximum depth of 23 m. Holes intersecting the vein at depths of 29 to 40 m returned low gold assays. Drilling on a small island in Cross Lake, to test the western extension of the vein, also returned low gold assays. The leases are currently under option to Treminco Resources Ltd. who staked adjacent claims in 1986 (Fig. 8-64).

DESCRIPTION

The property is underlain by Burwash Formation interbedded greywacke, shale arkose and quartzite metamorphosed to knotted quartz-mica schist and hornfels. Some knots include mica and chiastolite aggregates. The rocks have been folded into widely spaced recumbent folds with 35°-75° east- and northeast-dipping axial planes (Fig. 8-64).

CURRENT WORK AND RESULTS

In 1986-87 Treminco began an evaluation of the GAB showing which included, in January and February 1987, 877 m of drilling in 27 holes. Gold-bearing quartz veins are in contorted and drag-folded slate beds sandwiched between more massive metasedimentary beds. The quartz veins may contain sparse pyrite, pyrrhotite, arsenopyrite, chalcopyrite, sphalerite and galena.

In 1987, 30 man days were spent outlining the outcrop of the contorted slate, collecting 27 samples for assay, mapping the Sparta vein at 1:2000 and examining old drill core and showings, including trenches both north and south of Mac Lake.

Treminco estimate the Gab vein contains 10 900 t of 13.7 g/t Au and reports a previous estimate for the Sparta vein of 2720 t of 12.3 g/t Au.

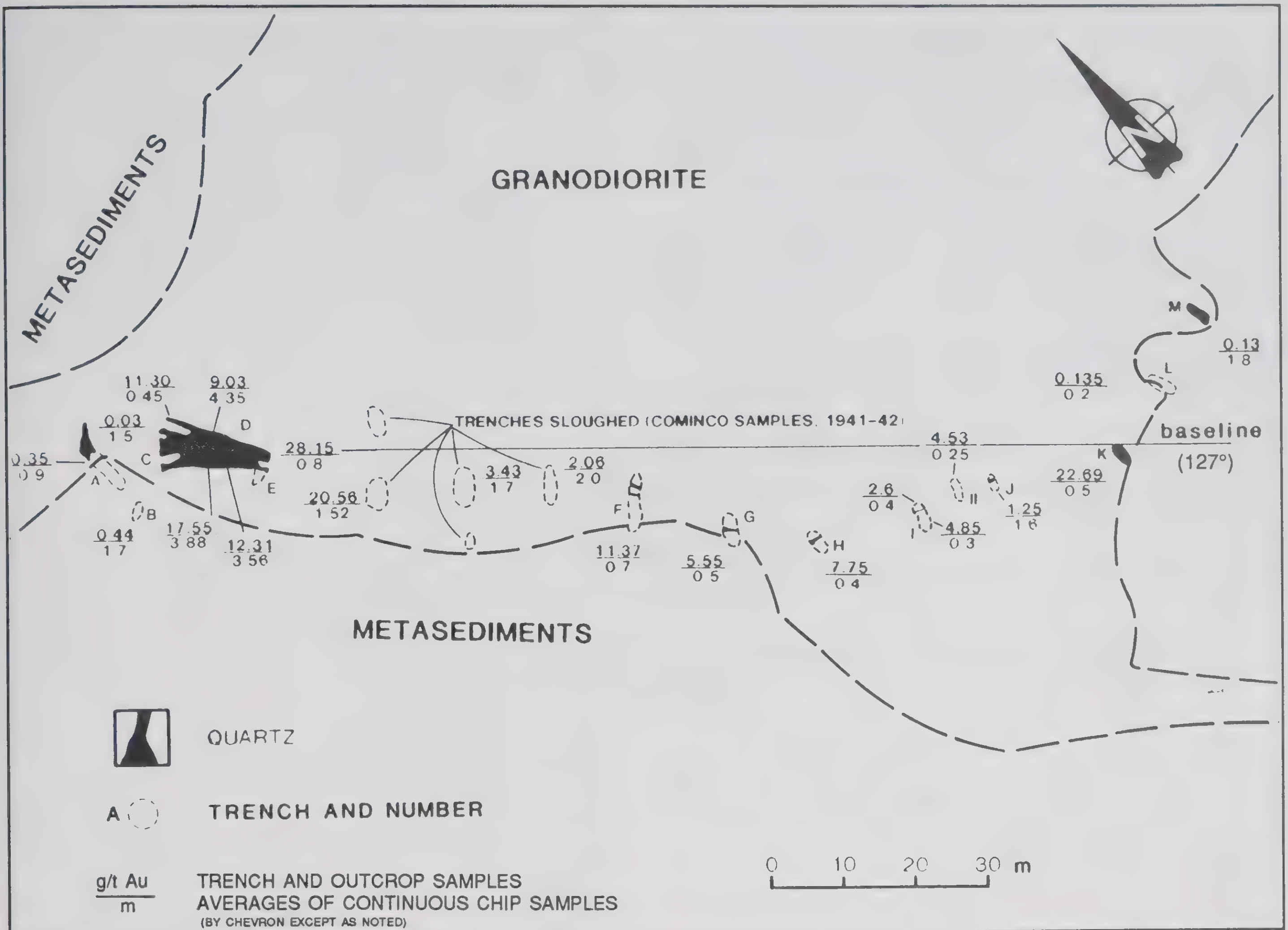


FIGURE 8-63: *Nicholas Lake deposit, trench locations and assay samples.*

MAHE PROPERTY

Giant Bay Resources Ltd.	Gold
440 - 808 W. Hastings St.	85 I/14
Vancouver, B.C., V6B 1N6	62°58'N, 113°19'W

REFERENCES

Henderson (1941); Henderson (1985); Stokes *et al.* (1988, 1989).

DIAND assessment reports: 081644, 081652, 081690, 082129.

PROPERTY

MAHE, MAHE 1-2, AR, AR1, BEAR, AD, POL claims and the LYNK 1-4 lease totalling 1720.3 ha.

LOCATION

The property is on the south west shore of Gordon Lake, north of Knight Bay. It adjoins the Camlaren Mine claims to the east (Fig. 8-65) and is 80 km north-northeast of Yellowknife.

HISTORY

The ground was staked in 1937 and prospected in 1938-44. Extensive surface work, including trenching, sampling and X-ray drilling was carried out by various companies including Sentinel Mines Ltd. The claims lapsed in 1947. MAHE was staked in 1978, AR and BEAR in 1981 and MAHE 1 and 2, POL, AR1 and AD in 1983. In 1981, the vein on the MAHE claim was tested by drilling 46 1 m holes in 26 trenches. Assays ranged from trace to 32.64 g/t Au (DIAND assessment report 081644). In 1982 another vein on the BEAR was tested by 70 1 m holes; the best assay was 1.37 g/t Au (DIAND assessment report 081652).

In 1983 Giant Bay Resources Ltd. acquired majority interest in the claim group. To investigate the gold-bearing quartz-breccia systems, during July to October 1983, Giant Bay gridded, mapped, prospected, blasted and sampled using a plugger at 255 sites for 182 m of core and between Sentinel and Gordon lakes and on MAHE drilled 9 BQ-size drill holes from 7 setups for 852 m of core (DIAND assessment report 082129). Drilling continued in 1984 with an additional 25 holes for 498.7 m of core which outlined a geologic reserve for the Kidney Pond zone of 500 000 t grading 5 g/t Au over an

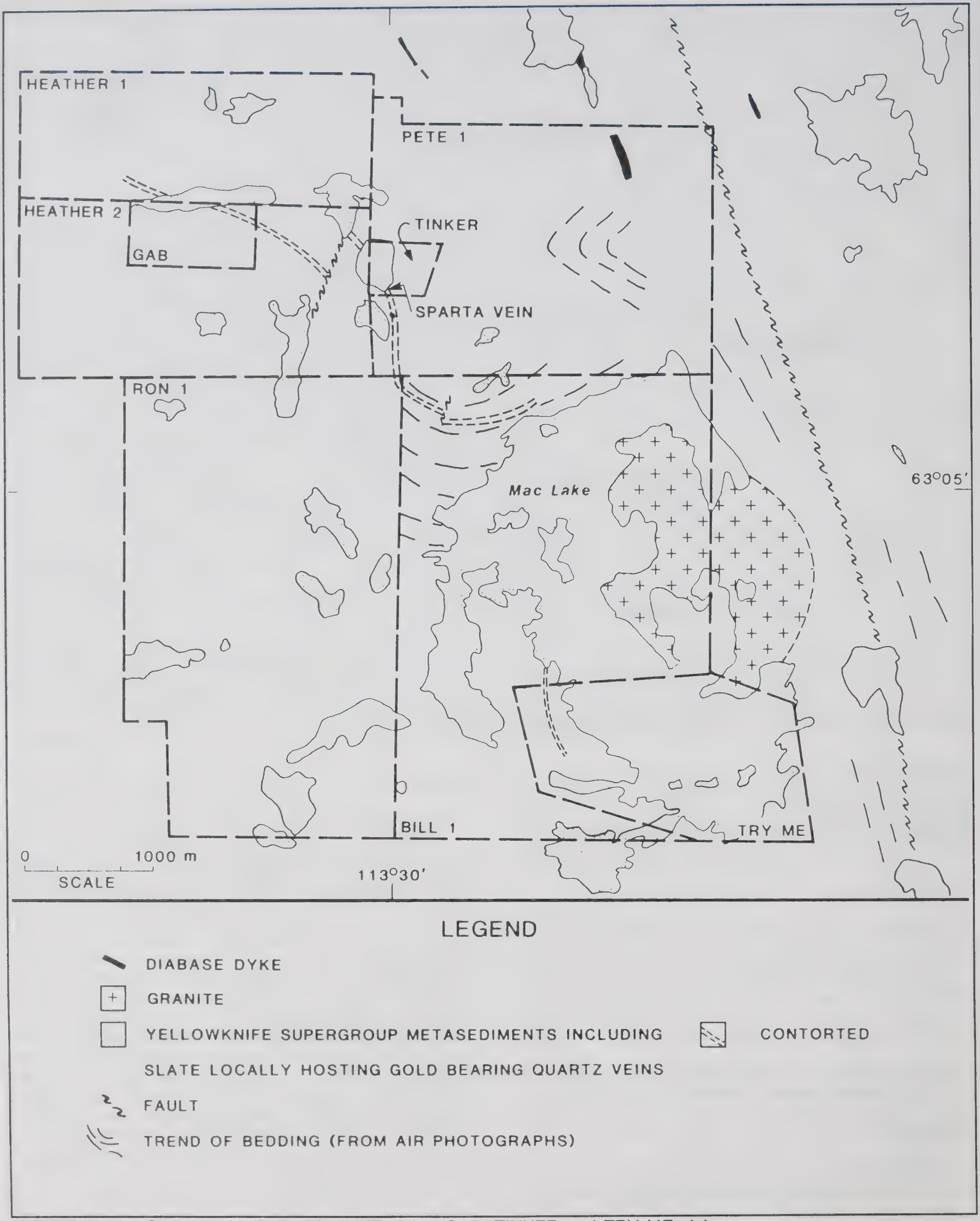


FIGURE 8-64: *Geology of HEATHER, PETE, BILL, GAB, TINKER and TRY ME claims.*

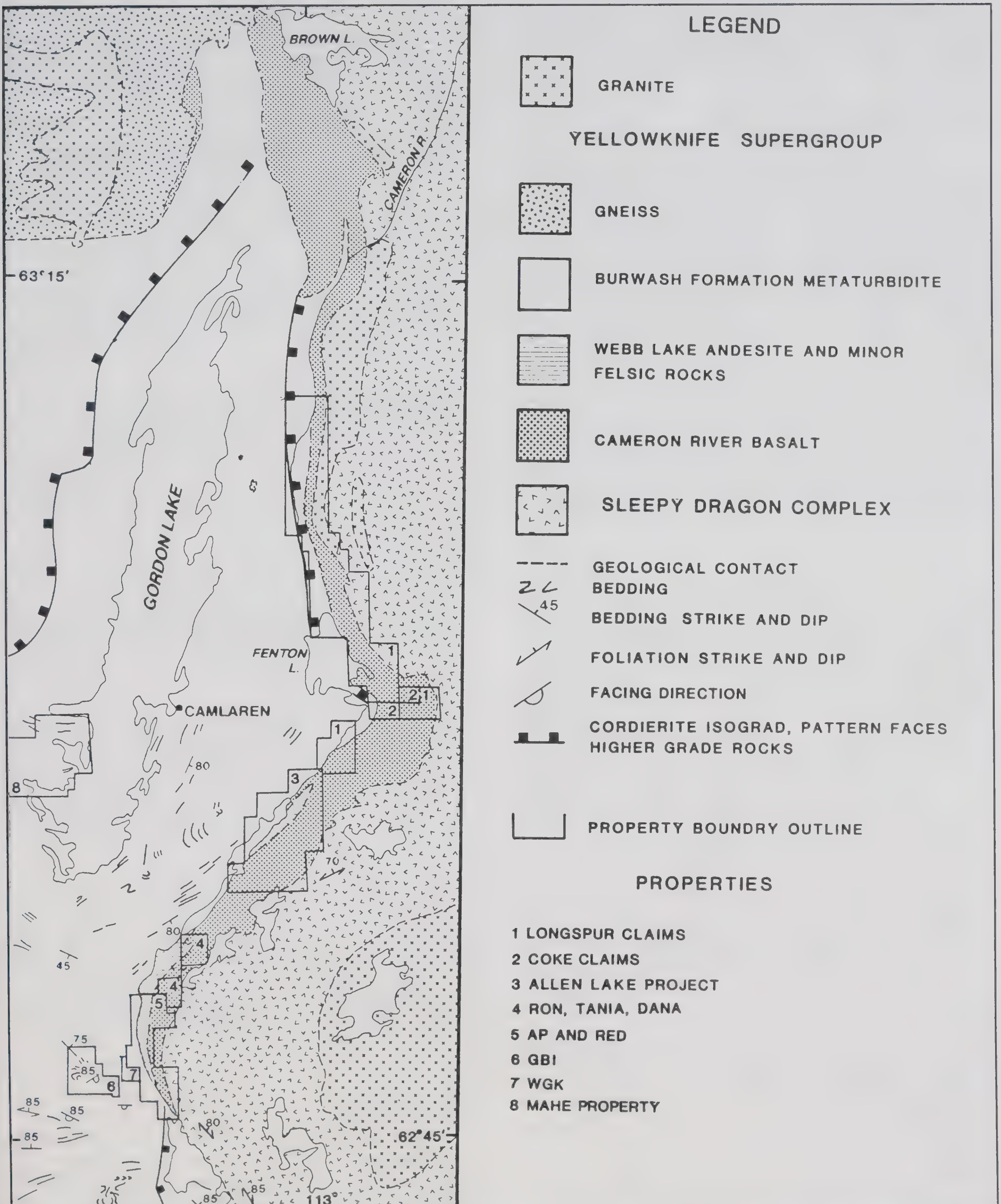


FIGURE 8-65: Geology and claim group outlines where 1986-87 work is reported in the Gordon Lake-Cameron River areas.

average width of 9 m to a depth of 121 m. Intersections were characterised by a high nugget effect making grade determination difficult. In 1985 11 NQ-size holes were drilled for 1587 m.

DESCRIPTION

On the property Burwash Formation greywacke with interbedded carbonaceous siltstone or argillite, slate and phyllite is isoclinally folded about northwest to west-northwest axes. In the Kidney Pond zone, auriferous quartz breccias are stratabound within thin-bedded alternating wackes and carbonaceous siltstones. These stratabound breccias were formed by intense, dextral bedding-parallel shear and complex repeated enechelon veining induced by asymmetrical tightening of the east limb of the Gordon Lake refold. The breccias are associated with distinct crenulation cleavage (Stokes *et al.*, 1989).

The west-northwest-striking mineralised zone has been traced along strike for 305 m, is open at depth and to the northwest and varies in thickness from 6 m to in excess of 30 m both along strike and at depth. Sulphide content is generally 2-3% and includes arsenopyrite, pyrrhotite, pyrite, chalcopyrite and galena, in decreasing order of abundance.

CURRENT WORK

During April to September 1986 contractor, Tonto Mine Development Ltd., completed 818 m of underground development, including a 488 m decline, two 3 m by 4.27 m drifts at the 61-m level totalling 165 m to test the No. 1 or Kidney Pond zone (Fig. 8-66). Giant Bay Resources drilled 2633 m of NQ core drilled during 1986: 791 m in 2 holes from surface and 1842 m in 70 holes on 13 sections from underground. Underground work included collecting between 30 and 75 2-3.5 kg grab samples from each round, chip sampling each face, wall and raise, and geologic mapping. Ore reserves using a 6.86 g/t Au cut off, a 1.2 m minimum width and a 2.8 specific gravity for assays cut to 69 g/t Au are 156 842 t at 17.28 g/t Au (DIAND assessment report 082129).

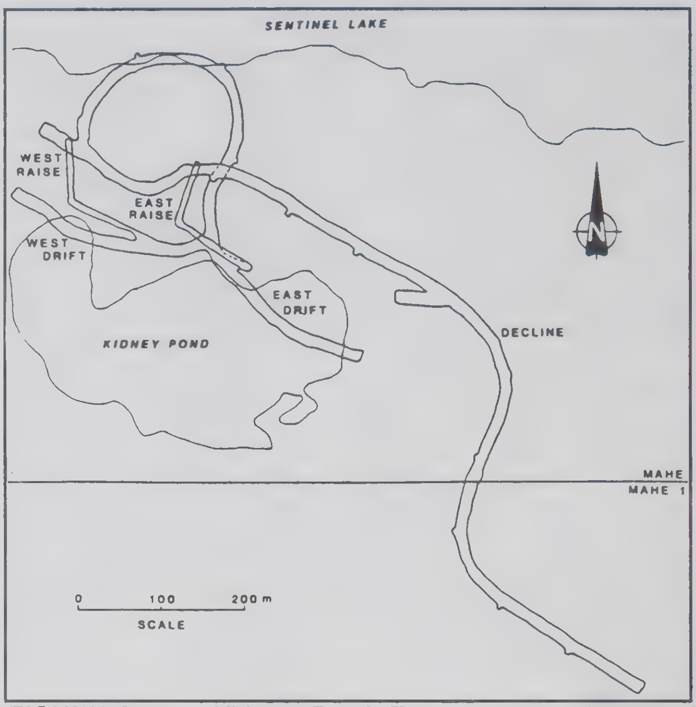


FIGURE 8-66: Kidney Pond Zone, 1986 underground exploration.

GBI CLAIMS

Candorado Mines
302 - 543 Granville St.
Vancouver, B.C., V6C 1X8

Gold
85 I/14
62°47'N, 113°15'W

REFERENCES

Gibbins *et al.* (1977); Henderson (1941); Henderson (1985); Lord (1951); Seaton *et al.* (1987).

DIAND assessment reports: 081471, 082634, 082108, 082304.

PROPERTY

GBI 1, 2, and 3.

LOCATION

The claims are between Dome Lake and Myrt Lake, about 12 km south of Gordon Lake and 70 km northeast of Yellowknife (Fig. 8-65).

HISTORY

The area has been extensively prospected, staked and restaked since prospectors working for Dome Mines Ltd. discovered gold showings south of Gordon Lake in 1938. Most of the area was previously covered by Dome's SDC group (Lord, 1951). Historical coverage is provided by Seaton *et al.* (1987). Claims GBI 1, 2 and 3 were recorded in 1980, 1981 and 1987 respectively.

DESCRIPTION

The claims are underlain by Burwash Formation, tightly folded, greenschist-grade, interbedded greywacke and shale with 2-15 m gossans marking beds of banded, graphitic iron formation with disseminated pyrite. Cross-cutting veins and lenses of quartz with sulphides containing gold are often associated with folds and fault zones and have been trenched (Seaton *et al.*, 1987).

CURRENT WORK

In 1987, percussion drilling of 223.7 m in 14 holes tested the number 10 showing, a large pod of grey quartz at the contact between sheared graphitic schist and massive greywacke. Accessory minerals include visible gold, arsenopyrite, pyrite, pyrrhotite, galena and chalcopyrite. Drilling was followed by geologic mapping and sampling.

WGK-1

Westfort Petroleums Ltd.
2001, 717 7th Ave. SW
Calgary, Alta. T2P 0Z3

Gold
85 I/14
62°47'N, 113°15'W

REFERENCES

Henderson (1985); Henderson (1941).
DIAND assessment report: 082553.

PROPERTY

WGK 1.

LOCATION

The claim is west of the Cameron River, 13 km south of Gordon Lake and 67 km northeast of Yellowknife (Fig. 8-65).

HISTORY

Gold was discovered in the area in 1938 by Dome Mines Ltd. Trenching, bulk sampling and drilling were completed in 1939 which outlined the WT zone. The claims lapsed in 1959 and the WGK claim was staked in July 1984.

DESCRIPTION

The claim is underlain by Burwash Formation, thick-bedded greywackes, laminated to medium-bedded argillites and siltstones with interbedded graphitic argillite, silicate- and sulphide-facies iron formation. These metasediments are folded and cross-cut by shear zones typically in argillite and iron formation-rich portions of the stratigraphy. Two mineralised zones, 13 and the None, are recognised. The 13 zone is an extensive east-trending shear which includes a grey quartz vein 43 m long by 2.4 m wide containing visible gold and associated arsenopyrite, pyrite, pyrrhotite, galena and sphalerite. The None zone, an auriferous quartz blow out, is at the west extension of the 13 zone where the strike swings round to 110° and intersects another structural trend at 130°. The best assay, 14.8 g/t Au, is a sample of iron formation cross-cut by quartz veins.

CURRENT WORK AND RESULTS

In summer of 1987 a ground magnetometer survey, geologic mapping and prospecting were completed and 42 grab samples and 2 chip samples from trenches were collected. Five equally spaced AX standard drill holes for 77.1 m of core were drilled along a 24 m strike length of Zone 13. Assays varied from a trace in argillite to 41.1 g/t Au over 0.64 m in an intersection of predominantly medium to dark blue-grey quartz. In September the claim was included in an airborne HEM and magnetic survey flown by DIGEM.

LONGSPUR PROPERTY

BHP-Utah Mines Ltd.
1600 - 1050 W. Pender St.
Vancouver, B.C., V6E 3S7

Gold
85 P/2,3; 85 I/15
63°04'N, 112°58'W

REFERENCES

Cullen (1986); Henderson (1985); Lambert (1982); Moore *et al.* (1951).
DIAND assessment report: 082702.

PROPERTY

LONGSPUR, LONGSPUR 2 - 7, LONGSPUR 9 - 15.

LOCATION

The LONGSPUR claims are on the east shore of Fenton Lake and the Cameron River, 100 km northeast of Yellowknife (Fig. 8-65).

HISTORY

LONGSPUR and LONGSPUR 2 - 7 were recorded in 1986, LONGSPUR 9 - 12 were added in 1987 and LONGSPUR 13 - 15 in 1988 by BHP-Utah Mines Ltd. to cover anomalous gold assay results from samples collected during reconnaissance of the Cameron River volcanic belt.

DESCRIPTION

The Longspur property covers 24 km of the north-trending contact between Burwash Formation metaturbidites and conformably underlying metavolcanics of the Cameron River volcanic belt (Figs. 8-56, 8-67). South of Fenton Lake the volcanic belt has a maximum width of 1.8 km. At Fenton Lake the strike of the belt changes from northeast to north "The Fenton Elbow" (Cullen, 1986) and the belt narrows to 0.5 km (Fig. 8-67). The volcanic belt overlies the granitoid terrain of the Sleepy Dragon Complex to the east. It is a west-facing steeply dipping homocline comprising amphibolite-grade dominantly basaltic to andesitic flows, with interflow greywacke and quartz-feldspar porphyry units, interpreted to represent felsic volcaniclastics which vary laterally to quartzite and calcsilicate schists and marbles. Burwash Formation sediments are isoclinally folded quartz-mica schist, cordierite-knotted quartz-mica schist and quartz-garnet-mica schist. Numerous Archean metagabbroic dykes and sills, up to tens of metres thick, strike subparallel with the belt, are most abundant at the east margin of the belt and intrude volcanics and the underlying granitoids. They rarely cross-cut the overlying sediments.

Proterozoic, north- to northwest-trending, diabase dykes cross-cut all units.

CURRENT WORK AND RESULTS

During 1986 BHP-Utah explored the Cameron River volcanic belt. Samples of silicified meta-andesite containing sulphides found close to the contact between Cameron River volcanics and Burwash metasediments assayed up to 720 ppb Au. A 15 cm by 2 m lens of quartz containing visible gold in metasediments was found on the contact. Assays were up to 41.2 g/t Au (Fig. 8-67). In 1987, 36 line-km of grid were cut and 69 line-km of grid were flagged for control of 1:5000 scale mapping and total field magnetometer and VLF EM surveys with station spacing at 12.5 m and 25 m respectively (Fig. 8-67). IP was completed over selected areas, totalling 6.7 line-km. Sampling showed that gold is associated with:

1. silicified metasediments, now quartz-biotite schists cross-cut by quartz veins and stringers with arsenopyrite and lesser pyrite and pyrrhotite close to the volcanic contact. The highest assay to date is 3560 ppb Au. The main showing, described above, found on the LONGSPUR claim, is enveloped by silicified metagreywacke with minor

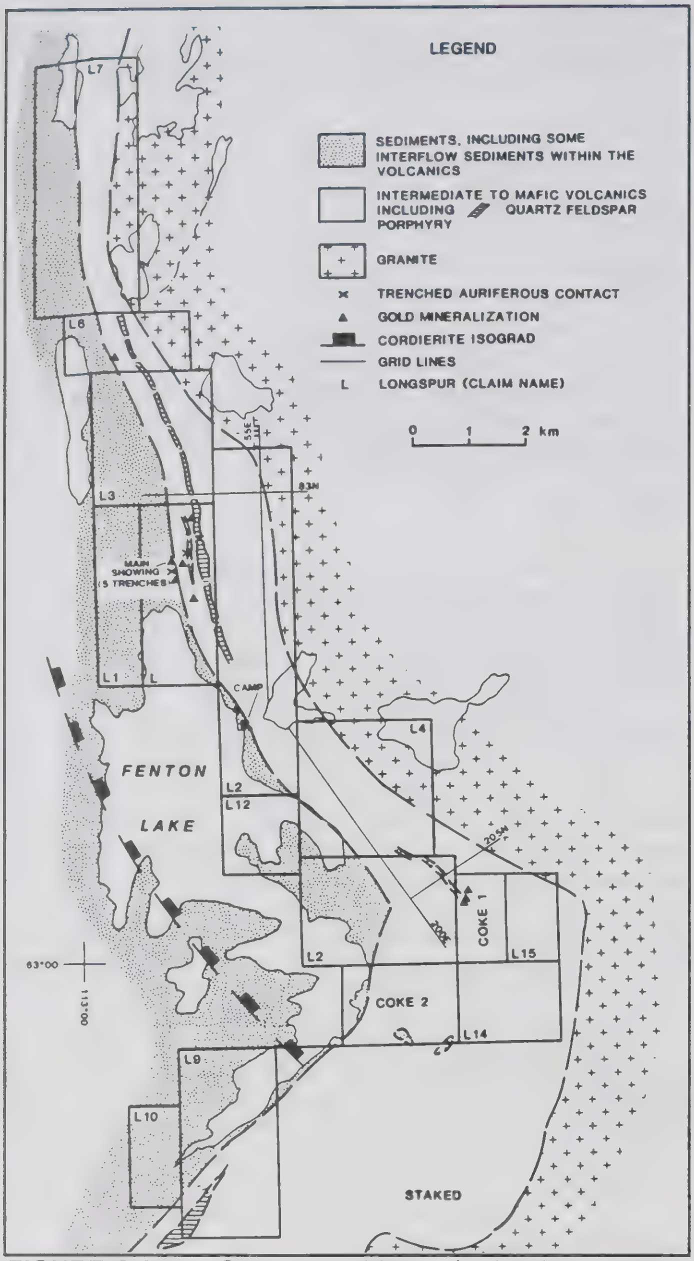


FIGURE 8-67: Geology, grids and showings on the LONGSPUR claim group and COKE claims.

arsenopyrite and pyrite. A chip sample across a 1 m width of the intensely altered halo (closest to the quartz lens) assayed 70.29 g/t Au. Although the sediment-volcanic contact is generally poorly exposed it was traced in 1987 using IP. The IP survey also identified several northeast-striking linears on LONGSPUR 3, north of the main showing, which were found to be poorly exposed shears, roughly 2 m wide containing abundant arsenopyrite (Fig. 8-67). Assays were anomalous in gold, zinc, lead, copper and silver. In 1987 within the contact area 6 trenches totalling 46.6 m were excavated. Trench #1 exposed a 14 m strike of quartz-veined, locally silicified greywacke and three adjacent 0.5 m intervals sampled returned 1870, 10 100 and 1050 ppb Au respectively. Trench #4 exposed a 6 m strike length of the contact between quartz-veined felsic tuff and greywacke with arsenopyrite, pyrrhotite and pyrite. Assays from a 2.3 m interval ranged from 530 to 3405 ppb Au.

2. the base of interflow metasediments particularly one 100 m wide band which has been mapped over a 1.3 km strike length (Fig. 8-67). The metasediments are cross-cut by quartz veins containing pyrrhotite and pyrite; the highest assays are 325 ppb.
3. quartz-feldspar porphyry and accompanying carbonate units especially at the contacts with mafic volcanics, where copper, zinc and silver content are also anomalous. This zone is typically the most sulphide rich, 20% pyrite and pyrrhotite is common and it has been traced using VLF in areas of overburden.

COKE Claims

Giant Yellowknife Mines Ltd.	Gold
Bag 3000	85 I/15; 85 P/2
Yellowknife, NWT, X1A 2M2	63°00'N, 112°55'W

REFERENCES

Henderson (1985); Lambert (1988); Moore *et al.* (1951).
DIAND assessment report: 082550.

PROPERTY

COKE 1-2.

LOCATION

The claims are on the southeast side of Fenton Lake, 105 km north-northeast of Yellowknife (Figs. 8-65, 8-67).

HISTORY

The claims were recorded in September of 1985 for Asamera Inc. to cover gold-bearing sulphide showings found during exploration of Cameron River metavolcanics. Giant Yellowknife Mines Ltd. conducted work in 1986 as a partner in a joint venture with Asamera and Kelmet Resources.

DESCRIPTION

The property is mainly underlain by mafic volcanics of the Cameron River volcanic belt (Fig. 8-56). Within a northeast-trending sequence of basic flows on COKE 1, a sulphide iron formation several metres wide and 100 m in strike length was sampled. Results include a geochemical anomaly of 180 ppb Au. COKE 2 covers the north-trending pyrite-carbonate Ladder zone, from which rock geochemical anomalies of up to 90 ppb Au were obtained in 1985. These are considered to be zones of exhalative interflow.

CURRENT WORK AND RESULTS

Work in 1986 was concentrated on the Ladder zone, a vuggy, pyrite, pyrrhotite silica-flooded fault zone forming a positive north-trending topographic lineament. The zone was geologically mapped at 1:2000 scale and three trenches were excavated. Six samples assayed trace to 0.34 ppm Au. Ten other rock samples were collected during reconnaissance prospecting.

ALLAN LAKE PROJECT

Ghost Lake Resources Ltd.	Gold, Zinc
P.O. Box 141	85 I/14,15
Rae, NWT, X0E 0Y0	62°54.5'N, 113°01.5'W

REFERENCES

Lord (1951); Henderson (1985); Henderson (1941); Lambert (1988).

DIAND assessment reports: 081641, 082060.

PROPERTY

AV, FF, JFD, JOE, JTC, GO, G.WEE, KEE, MAJ, NORA, RAE, RIETTE, and SOPHIEY totalling 2577 ha.

LOCATION

The property is east of Allan lake, about 85 km northeast of Yellowknife (Fig. 8-65).

HISTORY

The property covers part of the area staked in 1947 as the MINDOT claims by Gateway Gold to cover a quartz vein with gold, chalcopyrite, arsenopyrite, native bismuth, native copper and malachite on which trenching and sampling were carried out (Lord, 1951). In 1953 Gateway Gold drilled three holes for 107 m and in 1957, Pickle Crow Mines Ltd. drilled four holes totalling 172 m. In 1959, J.R. Woolgar drilled 1525 m distributed between:

1. the Mindot vein, explored by 13 holes along a strike length of 100 m. The vein graded up to 8.56 ppm Au across widths of less than 1 m. The vein strikes N30°E and dips 20° to 35° southeast. It cross-cuts pillowed flows.
2. a chloritized shear zone, explored by 30 holes along a strike length of 1036 m. Only one substantial gold assay, 12.34 ppm Au across 2 m, was obtained, but the zone often comprised up to 30% pyrite, pyrrhotite, chalcopyrite, sphalerite and arsenopyrite across widths of 1-2 m.
3. a discontinuous quartz lens, probed by four holes.

John Doucette staked the JFD claim, to cover the three showings in May 1982 and did some trenching and assayed several rock samples for gold and silver (DIAND assessment reports: 082060, 081641). The remaining claims were recorded in 1983 and early 1984 and all were transferred to Ghost Lake Resources in 1984.

DESCRIPTION

The property spans the northeasterly trending contact between metaturbidites of the Burwash Formation to the west and mafic metavolcanics of the Cameron River volcanic belt to the east (Fig. 8-65). The volcanics comprise massive to pillowed mafic flows, amphibolite, tuff, volcaniclastics and graphitic schist. These units are cut by gabbroic dykes, quartz veins, and locally by northeast-trending chloritized, silicified and sulphidized shears up to 25 m wide. A zone of rhyolite, rhyolite breccia and quartz breccia is exposed at the south end of Hank Lake near the intersection of north- and east-trending lineaments.

CURRENT WORK AND RESULTS

Work done in 1983 and 1984 is reported here because it was filed after the previous Mineral Industry Report was written. In 1983 a three-person crew spent two days evaluating the property and testing the EM responses of conductive zones. In 1984, a grid was established and used as a base for 1:5000 scale geological mapping and magnetometer and VLF EM geophysical surveying. Some of the core from the 1959 drilling of the shear zone was collected for assay. South of Hank Lake, zinc grades of 2.5% and 4.85% were obtained over widths of up to 25 m. One assay of 3.1 ppm Au was obtained from a grab sample of pyritic rhyolite breccia.

TANIA, DANA, RON Claims

Cove Energy Corporation	Gold, Base Metals
1730, 999 W. Hastings St.	85 I/14
Vancouver, B.C., V6C 2W2	62°49'N, 113°10'W

REFERENCES

Henderson (1985); Henderson (1941); Lambert (1988).

DIAND assessment reports: 017969, 018842, 082151, 082209.

PROPERTY

TANIA, DANA, and RON (543 ha).

LOCATION

The claims are 100 km east of Yellowknife on Webb Lake.

HISTORY

The property partly coincides with an area previously staked as the RS group, which was drilled by Giant Yellowknife Mines Limited in 1967 (DIAND assessment report 017969) and geophysically surveyed by Anglo Celtic Explorations Limited in 1969 (DIAND assessment report 018842). The claims were staked in 1984 and 1985 and were transferred to Cove Energy Corporation in November 1985.

DESCRIPTION

The claims cover part of the Cameron River volcanic belt and are underlain predominantly by northeasterly trending, steeply dipping metabasalts. Samples from old trenches that expose arsenopyrite-bearing quartz veins in shear zones assay up to 24 ppm Au.

CURRENT WORK AND RESULTS

Work done in 1985 is reported here as it was filed after the previous Mineral Industry Report was written. In 1985, magnetometer and EM surveys were conducted on 3 grids (Fig. 8-68; DIAND assessment report 082151). Three holes totalling 390 m drilled in late 1985 on the origin grid (Fig. 8-68), and another five holes for 459 m in 1986 intersected mafic to intermediate metavolcanic rocks and graphite metasediments and cherty tuff. The graphite sediments contain minor pyrrhotite, pyrite, sphalerite, and chalcopyrite.

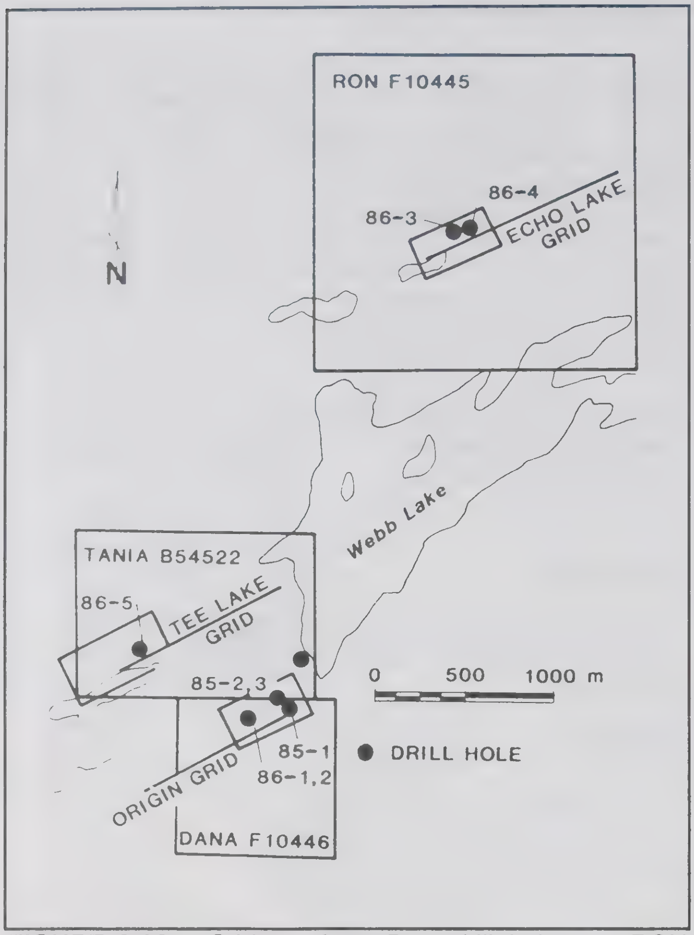


FIGURE 8-68: Grids and 1985-86 drill holes on RON, TANIA and DANA claims.

AP AND RED

Tanqueray Resources Ltd.
100 - 625 4th Ave. SW
Calgary, Alta., T2P 0K2

Gold, Zinc
85 I/14
62°47'N, 113°13'W

REFERENCES

Gibbins *et al.* (1977); Henderson (1985); Henderson (1941); Lambert (1988); Seaton (1978, 1984).

DIAND assessment reports: 019193, 080017, 080167, 080177, 080469, 081130, 082059, 082656.

PROPERTY

AP, AP 3-4, AP 44, AP 45, AP 47, AP 48, RED, RED 2 (1484 ha).

LOCATION

The claim group is on the Cameron River east of Myrt Lake approximately 70 km northeast of Yellowknife (Fig. 8-65).

HISTORY

Dome Mines Limited discovered the WT gold showings west of the AP claims in 1938, and in 1945 the Prospect Street Syndicate staked a large block of claims that included the area now covered by the AP and RED block. The claims are owned by C. Vaydik and have been staked and restaked since 1967. Work in the early 1970's included prospecting and sampling of arsenopyrite-rich quartz veins (DIAND assessment reports: 019193, 080017). In 1974 Precambrian Shield Resources Ltd. optioned the property and did additional sampling (DIAND assessment report 080167). In 1975, detailed (1 inch = 200 feet) geological mapping, and ground EM and magnetometer surveys defined a moderate conductor flanked by a magnetic conductor. Results from drilling of 444.7 m in four holes, AP 01-04 (DIAND assessment reports: 080177, 080469) included a 5.18 m intersection in AP 01 of 4.4 g/t Au and a 3.05 m intersection in AP 02 of 4.8 g/t Au. Zinc and copper contents were anomalous; the best zinc assay was 1.04% Zn over 3 m. In 1979 Giant Yellowknife Mines Ltd. optioned the property and in 1980 drilled 3 holes, AP 05-08 for 472 m of core. Assays from 0.34 to 0.68 g/t Au were common throughout the holes and AP-08 returned 3.42 g/t Au over 0.46 m. Giant also conducted lithogeochemical and gossan sampling to outline alteration zones. Gossan samples commonly returned assays from 0.34 g/t Au to 1.71 g/t Au; the highest was 11.6 g/t Au. In 1981, Giant drilled 415 m in three holes based on their interpretation of the chemical data. Discouragingly low gold assays were returned and Giant dropped the option.

In 1985, Aber Resources Ltd. optioned the property, established a new grid on 20 m line and station spacing and conducted geological mapping, sampling and ground EM and magnetic surveys. Grab samples assayed from trace to 10.28 g/t Au. Aber drilled three holes, AP 12-14, which intercepted 1.03 g/t Au over 5 m in AP 12, 0.83 g/t Au over 6 m in AP 13 and 1.99 g/t Au over 12 m in AP 14.

DESCRIPTION

Mafic to felsic flows and agglomerates of the Cameron River volcanic belt and conformably overlying metasediments, chiefly turbidites, form a north-trending east-dipping homocline (Fig. 8-69). Silicate iron formation containing amphibole, garnet and minor sulphides at the contact between the volcanics and the sediments is sheared and cross-cut by quartz veins. This is referred to as the Shear zone. The contact between mafic-intermediate and felsic volcanics is characterised by carbonate alteration, sulphides and quartz veining and is called the Sulphide zone. Drilling intercepted altered volcanics and sediments cross-cut by quartz veins and stockworks containing pyrrhotite, arsenopyrite, pyrite, chalcopyrite, sphalerite and trace galena.

CURRENT WORK

In 1987 Tanqueray optioned the property and geologically mapped, prospected, and had an HEM-MAG survey flown by Digem. Four diamond drill holes, T 87-1 to T 87-4, for 469.3 m of core tested geophysical conductors on AP 45. Drill hole T 87-4 returned the best assay, 0.75 g/t Au over 1.5 m (Fig. 8-69).

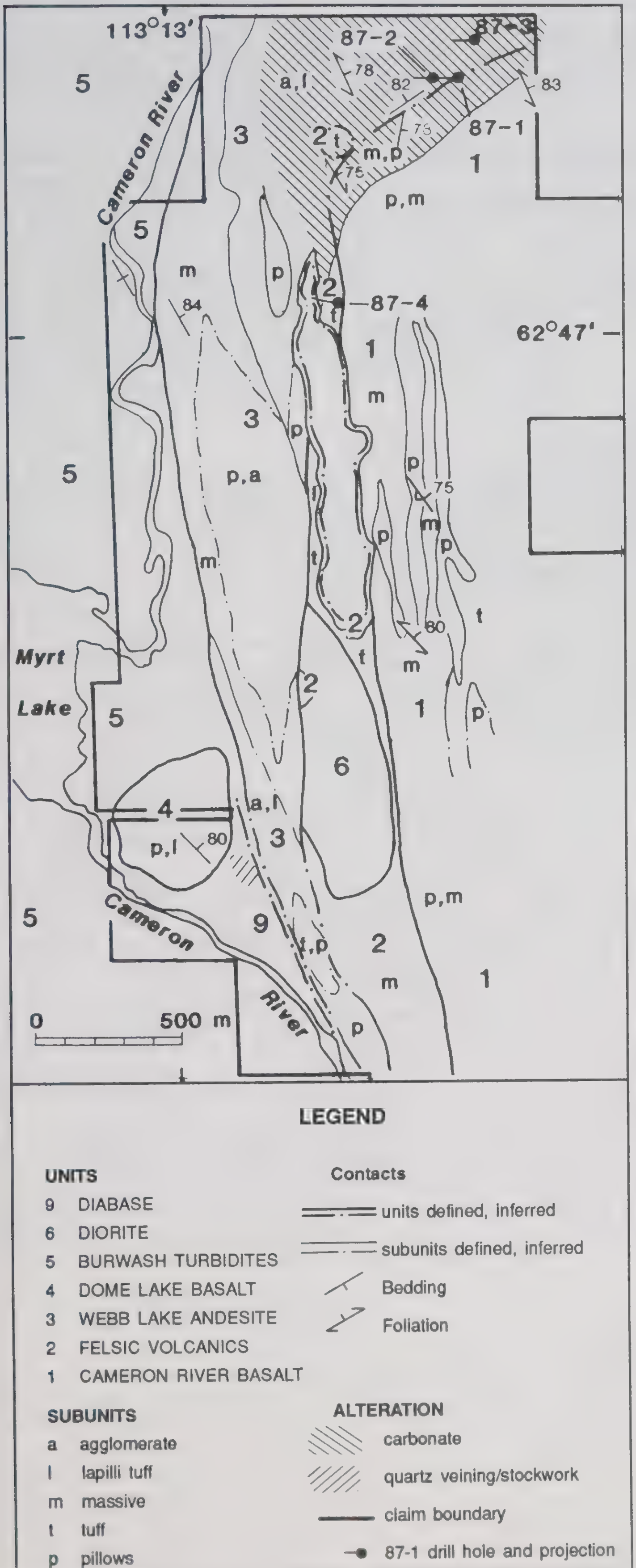


FIGURE 8-69: Geology and 1987 drill holes on AP and RED claims.

SULPHIDE LAKE PROJECT

Noranda Exploration Co. Ltd. (N.P.L.)	Base Metals, Silver, Gold
4 - 2130 Notre Dame Ave.	85 I/10,11
Winnipeg, Man., R3H 0K1	62°36' N, 112°54'W

REFERENCES

Henderson (1985); Lambert (1988); Padgham *et al.* (1975); Seaton *et al.* (1987).

DIAND assessment reports: 017317, 017320, 017322, 081985, 082518, 082616.

PROPERTY

VIC 01, NORA 1-9, XXX 01,02,04, CATH, JUD, MIKE, SNOOT 1,2, BETH, BRIAN, MOE and SUE.

LOCATION

The claims are 75 km northeast of Yellowknife and extend from Victory Lake east to Detour Lake and south to Devore Lake (Fig. 8-70).

HISTORY

The claims are contiguous with the EMILY 2 claim covering base metal showings staked in 1937 as the RUTH claims and trenched and drilled by Cominco between 1937 and 1939. The gossanous showings of pyrite, chalcopyrite, pyrrhotite, galena, sphalerite and arsenopyrite are at the contact between rhyolite and sediments. In 1953 Cominco again staked the ground as the LEN claims and conducted EM surveys which delineated a strong conductor. Nine holes were drilled aggregating 506 m to test 609 m of strike. The best results are from a 10.9 m intersection averaging 3% combined Zn and Pb enveloping a 6.1 m interval with 1.17% Zn, 2.2% Pb and 42 ppm Ag. In 1971 Teck Corporation and Great Plains Development had an INPUT EM survey flown over the area. In 1983-84 Noranda staked 31 claims to cover AEM anomalies from the 1971 survey. Subsequent work, the Weaver Lake project, included ground geophysics and 400 m of drilling in 5 holes (DIAND assessment report 081985; Seaton *et al.*, 1987).

DESCRIPTION

The property is underlain by the Detour-Turnback lakes and Beaulieu River volcanic belts of the Archean Yellowknife Supergroup (Fig. 8-56; Henderson, 1985; Lambert, 1988). Folded mafic flows, intermediate and felsic flows and tuffs with minor intercalated sediments are bounded to the southwest by lower amphibolite-grade metasediments. Units are intruded by numerous small plugs, dykes and sills ranging from granodiorite to feldspar porphyry and granite associated with the large intrusions on the east and west margins of the property (Fig. 8-70).

CURRENT WORK AND RESULTS

Exploration in 1986 and 1987 included collecting 165 samples, and mapping at 1:31 680 scale the "sulphide area" covered by parts of NORA 2-6, SNOOT 2, JUD, MIKE and CATH and the EMILY 2 claim. Sampling, mapping at 1:2500 and a gravimetric survey were completed on the SUE claim (Fig. 8-70).

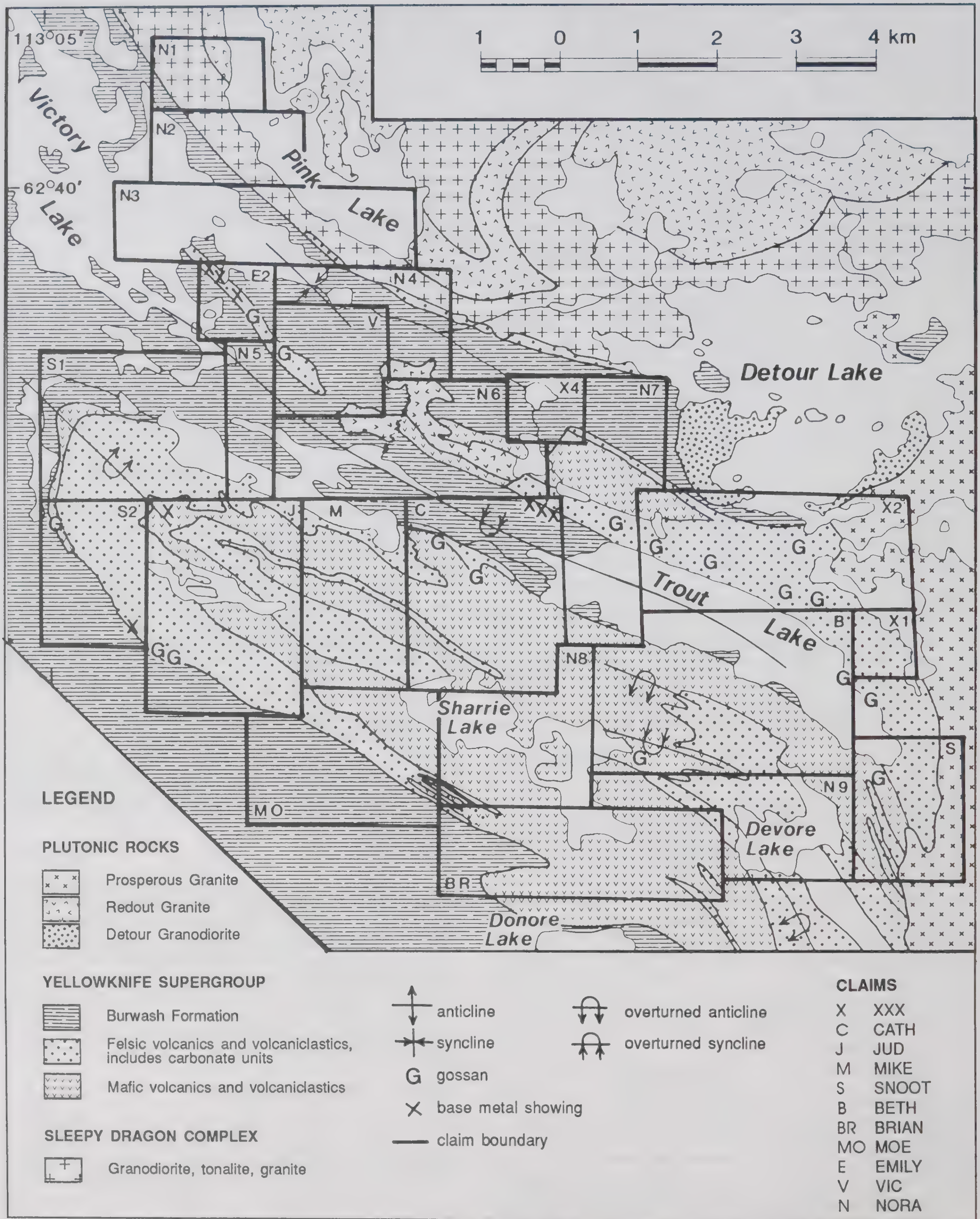


FIGURE 8-70: Geology, claims, gossans and base metal showings in the Detour-Turnback lakes area.

Targets include:

1. base metals, sphalerite, galena and pyrite are interbanded with siliceous layers within intermediate volcanics. These form gossanous zones extending from Victory Lake through EMILY 2 and on to VIC 1, and similar showings on SUE 1.
2. gold in siliceous oxidized iron-rich zones along volcanic-sedimentary contacts which locally are sheared and contain quartz veins.
3. numerous contact-related gossans and oxidized shear zones.

KA and PAM CLAIMS

Giant Yellowknife Mines Ltd. — Gold, Base Metals
Bag 3000 — 85 P/1
Yellowknife, NWT, X1A 2M2 — 63°17'N, 112°12'W

REFERENCES

Covello *et al.* (1988); Moore *et al.* (1951); Roach (1988); Seaton *et al.* (1987); Stubley (1989).
DIAND assessment reports: 019652, 081888, 082552.

PROPERTY

KA 1, PAM 1-2.

LOCATION

The claims are in the Bridge Lake - Top Lake area south of Beniah Lake, 120 km northeast of Yellowknife.

HISTORY

The area was explored in the early 1970's for base metals. Just east of KA 1 on the former GG 9 claim a diamond drill hole intersected 2.4 m grading 0.12% Zn, 0.08% Cu, 10.29 ppm Ag, 0.34 ppm Au (DIAND assessment report 019652). The KA 1 claim east of Bridge Lake was recorded for Mr. William Kizan in August of 1983 and transferred to Giant Yellowknife Mines Ltd. in May, 1985. That year, Giant discovered and sampled showings and collected samples from trenches, probably dating from the mid-1940's (Seaton *et al.*, 1987; DIAND assessment report 081888).

DESCRIPTION

The KA and PAM claims are underlain by volcanics of the northern portion of the Beaulieu volcanic belt; granitic gneisses crop out to the west of Bridge Lake and to the east of Top Lake (Fig. 8-71; Moore *et al.*, 1951). Volcanics are dominantly mafic flows with lesser felsic volcanics, intermediate and irregular gabbro bodies, felsic dykes and intermediate flows.

CURRENT WORK AND RESULTS

In 1986, exploration by Giant found a series of 1 m wide sulphidic zones in intermediate volcanic rocks. A sample collected from the Notag showing, 450 m south of Top Lake, assayed 6.2 ppm Au (Fig. 8-71). The showing was protected by staking PAM 1-2 in September, 1987. A grid was established to serve as a base for 1:2000 scale mapping. Eleven samples were collected from the grid, including five from trenches previously excavated on the Notag showing. No samples taken in the 1987 survey returned significant assays, and anomalies previously obtained from trench samples could not be duplicated.

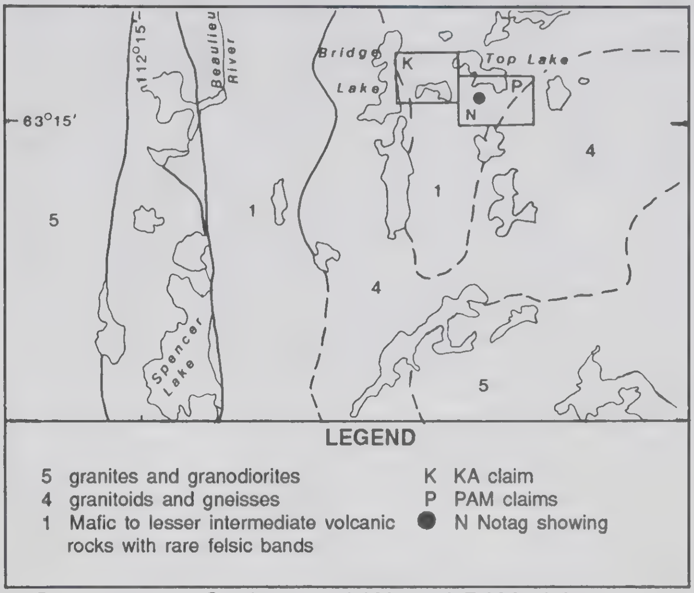


FIGURE 8-71: *Geology and KA and PAM claims.*

SUNRISE JOINT VENTURE

Aber Resources Ltd. — Base Metals, Silver, Gold
700, 1177 W. Hastings St. — 85 I/16; 85 P/1
Vancouver B.C., V6E 2K3 — 62°55'N, 112°22'W

REFERENCES

Henderson (1985); Lambert (1988); Moore *et al.* (1951); Vivian *et al.* (1988).
DIAND assessment report: 082690.

PROPERTY

DJ 1-18, DOUG 1 and SIDE 1 (Fig. 8-72).

LOCATION

The property is 115 km east-northeast of Yellowknife on the Beaulieu River (Fig. 8-56). The right of way for the Ingraham Trail extension is surveyed and cut to within 5 miles west of Sunrise Lake.

HISTORY

The claims were recorded in late 1987 and are held under a joint-venture agreement between Aber Resources Ltd., operator, and Hemisphere Development Corporation.

DESCRIPTION

The property covers a 32 km long segment of the Archean Beaulieu River volcanic belt of the Yellowknife Supergroup (Fig. 8-56). It is underlain by mafic volcanics of the Sunset Lake Basalt, lesser dacidic to andesitic volcanics of the Alice Formation and just north of Sunset Lake by rhyolite flows, tuffs and volcaniclastics (Fig. 8-72).

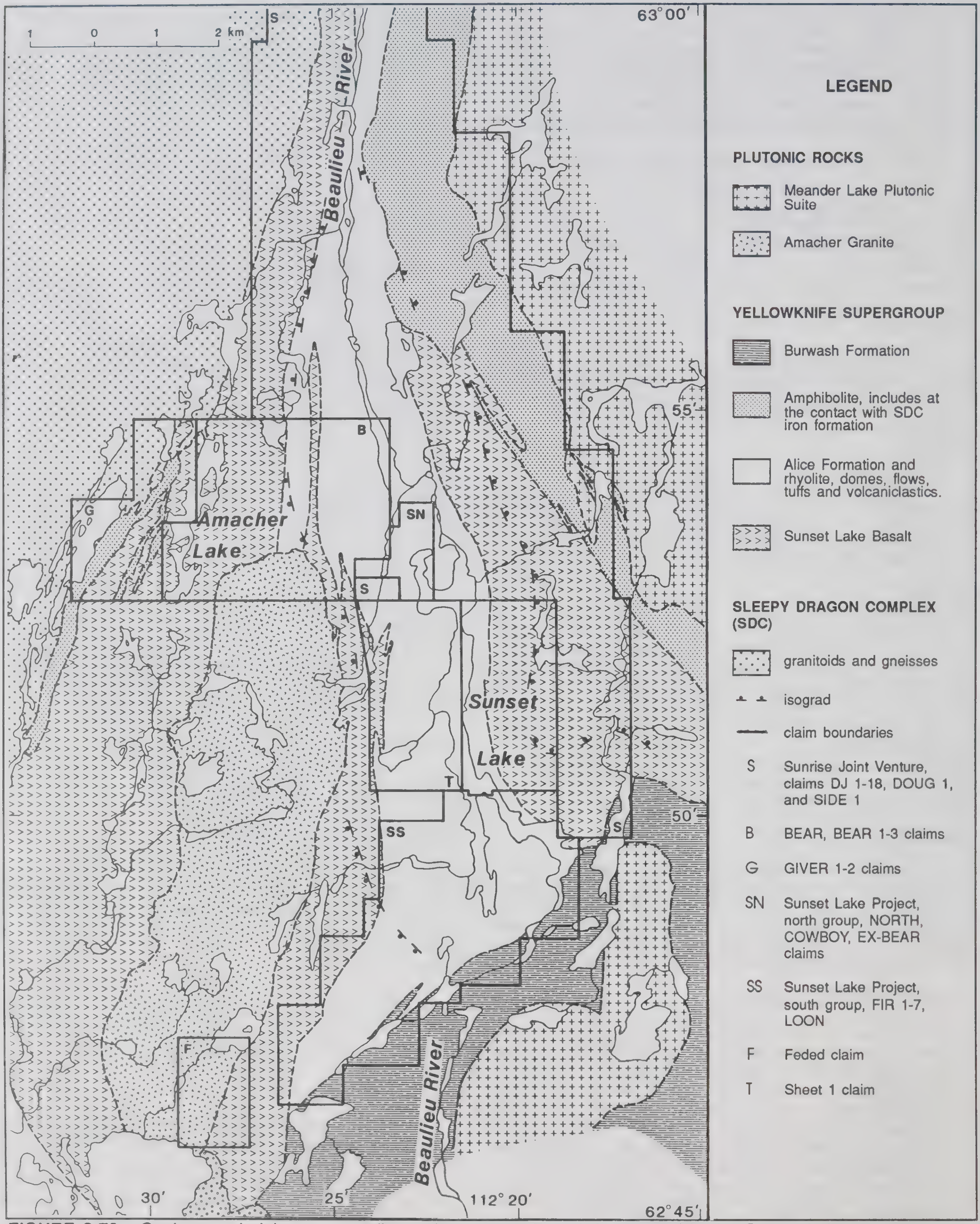


FIGURE 8-72: Geology and claim group outlines where 1986-87 work is reported in the Sunset Lake area.

CURRENT WORK AND RESULTS

In 1986, Aber Resources and Hemisphere Development jointly undertook exploration for gold from north of Beniah Lake to south of Turnback Lake, the Drybones project covering a 100 km strike length of the Beaulieu River volcanic belt. This exploration was under the direction and management of Covello, Bryan and Associates of Yellowknife. On the basis of favourable geology and competitor activity in the area, DJ 1-5 claims were staked in the Sunrise Lake area. In mid-1987, grids were established over which combined magnetometer, VLF and HL EM were conducted. These geophysical surveys detected an overburden-covered conductor having no magnetic expression. The conductor corresponded with an interpreted rhyolite-andesite contact. The first hole was drilled in October 1987 to test a gold-copper showing and it intersected stringer-type base metals. A second hole spotted 120 m to the north along the conductor intersected 5.8 m of sulphides grading 18.3% combined Zn-Pb, 926 ppm Ag, and minor gold and copper. These results prompted additional land acquisition and 15 claims, DJ 6-18, SIDE 1 and DOUG 1, were added to Aber/Hemisphere's land holdings in November 1987 (Fig. 8-72). Drilling continued through 1988. By the end of 1987, 15 holes were completed for 1698.61 m.

The Sunrise deposit is an Archean polymetallic zinc-lead-copper-silver-gold-banded massive sulphide lens hosted by a rhyolite tuff which has been brecciated. The lens is conformable with the stratigraphy, dips at 60°-65° to the east and plunges 60° to the north (Figs. 8-73, 8-74). The ore suite comprises pyrite, sphalerite, galena, tetrahedrite, arsenopyrite, pyrrhotite, chalcopyrite, pyrargyrite, boulangerite, native silver, native gold, gudmundite and stannite. In 1987-88, 65 holes totalling 18 951.34 m of core outlined the ore zone, with a strike length of 160 m, of an average thickness of 3 to 3.5 m and a down-dip projection of approximately 700 m. The ore zone appears to have been deformed by a prominent block fault, indicative of a caldera-type setting. Grade and tonnage calculations suggest: probable tonnage of 1 162 200 t grading 8.35% Zn, 4.05% Pb, 0.09% Cu, 356.61 g/t Ag and 0.99 g/t Au; and possible tonnage at 704 000 t grading 9.76% Zn, 4.51% Pb, 0.11% Cu, 483.4 g/t Ag and 0.92 g/t Au (Vivian *et al.*, 1988).

BEAR CLAIMS

Silver Hart Mines Ltd.	Base Metals, Silver, Gold
5710, 17th St.	85 I/9,10,15,16
Edmonton, Alta., T6P 1S4	62°53'N, 112°25'W

REFERENCES

Dudek (1988); Henderson (1985); Lambert (1988); Seaton *et al.* (1987).

DIAND assessment reports: 017315, 081902, 082181, 082814.

PROPERTY

BEAR, BEAR 1-3.

LOCATION

The claims are on the west side of the Beaulieu River in the Sunset Lake area, 110 km east-northeast of Yellowknife (Figs. 8-72, 8-73, 8-75).

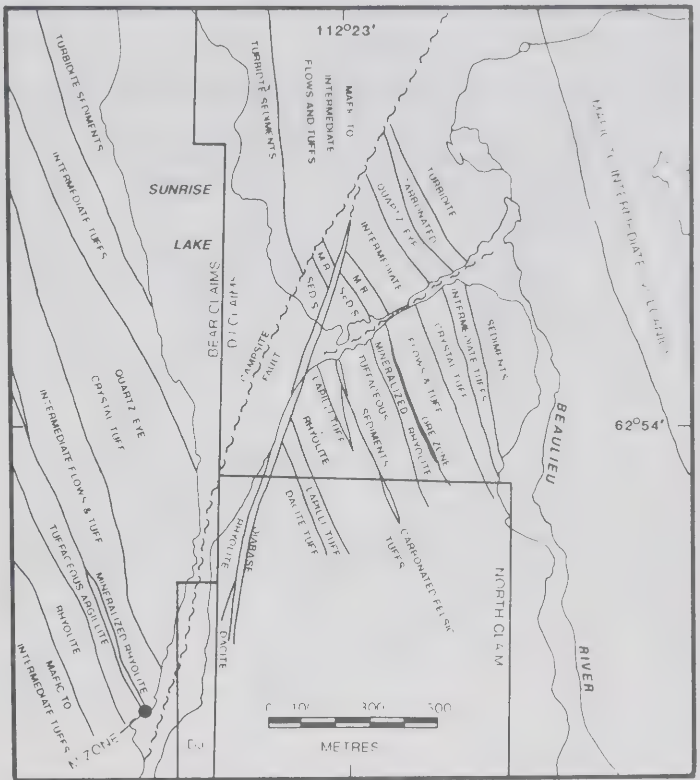


FIGURE 8-73: Geology of the Sunrise deposit area.

HISTORY

Portions of the BEAR claims were staked between 1945-50 and were trenched and drilled although no assessment work was filed. In 1963, ground reconnaissance was conducted along with an airborne magnetic survey by Nochay Investments Ltd. In 1970, an airborne EM survey was completed by Questor. No further work was done on the property and the claims lapsed. Silver Hart Mines Ltd. staked the BEAR claims in 1983. Prospecting in 1983 identified the gold-bearing C zone (Fig. 8-75). Grab samples from the C zone assayed up to 18.5 g/t Au and rock chip samples from trenches assayed up to 12 g/t Au over 1 m. In 1984, ground magnetic and EM surveys were completed over the C zone followed by diamond drilling of 1372 m in 15 holes. In May 1985, the property was optioned to Ark La Tex Industries Ltd.

DESCRIPTION

Mafic volcanic rocks of the Sunset Lake Basalt and mafic sills underlie the west part of the claim group. Alice Formation felsic andesite pillow lavas, pillow breccias, hyaloclastics and minor massive lavas including dacidic types, pyroclastics, volcaniclastic sediments, chert, iron formation and shales with interbedded rhyolite tuffs underlie the eastern part of the claim group (Fig. 8-72). Beds are steeply dipping, folded about north-trending axes and strike north to north-northwest. Gold is associated with (1) disseminated arsenopyrite in chlorite schists, and in schistose, silicified quartz porphyry and (2) massive arsenopyrite in lenses, breccia pods and stringers in zones of silicification associated with iron formation.

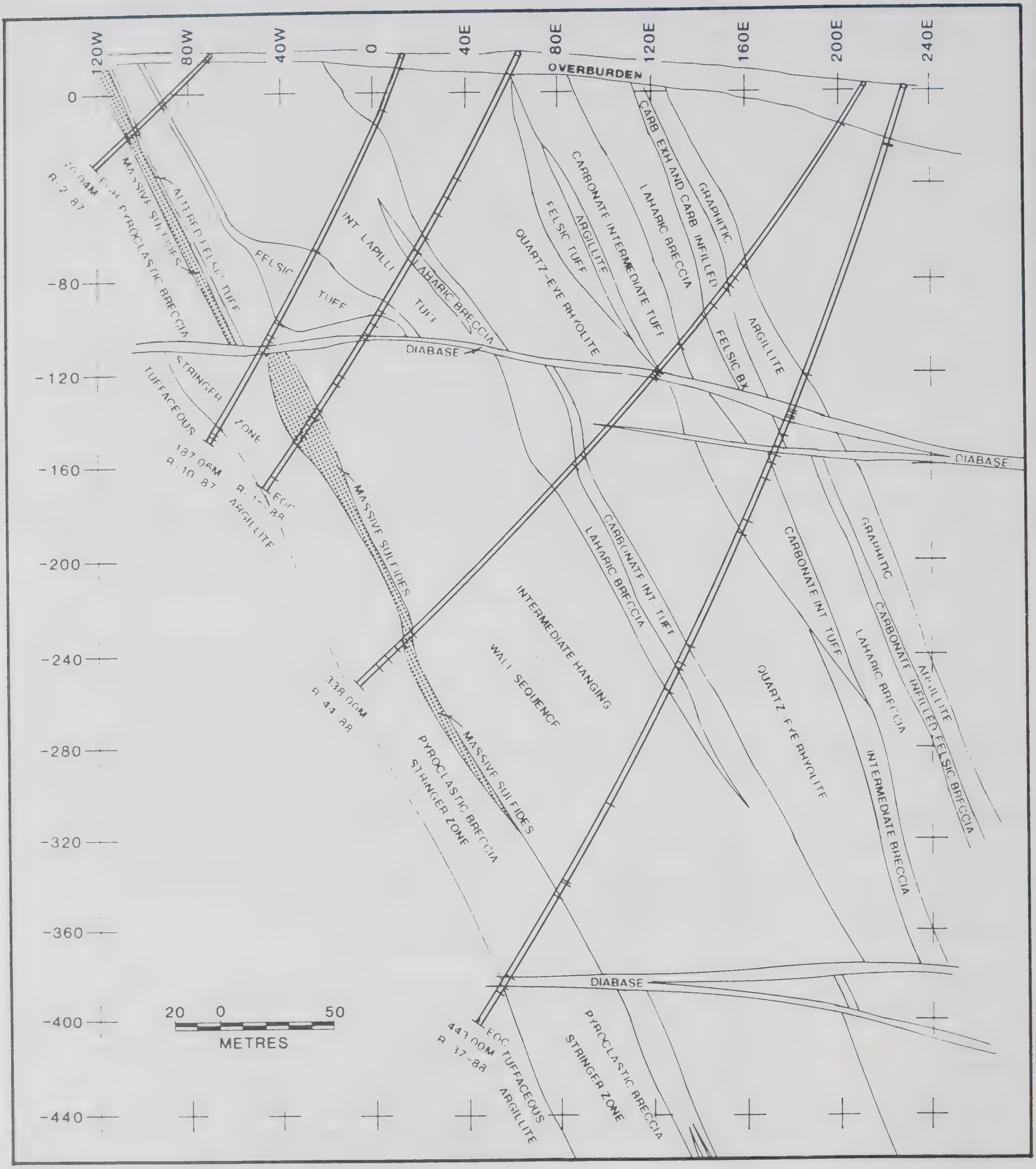


FIGURE 8-74: Geological cross section through the Sunrise deposit.

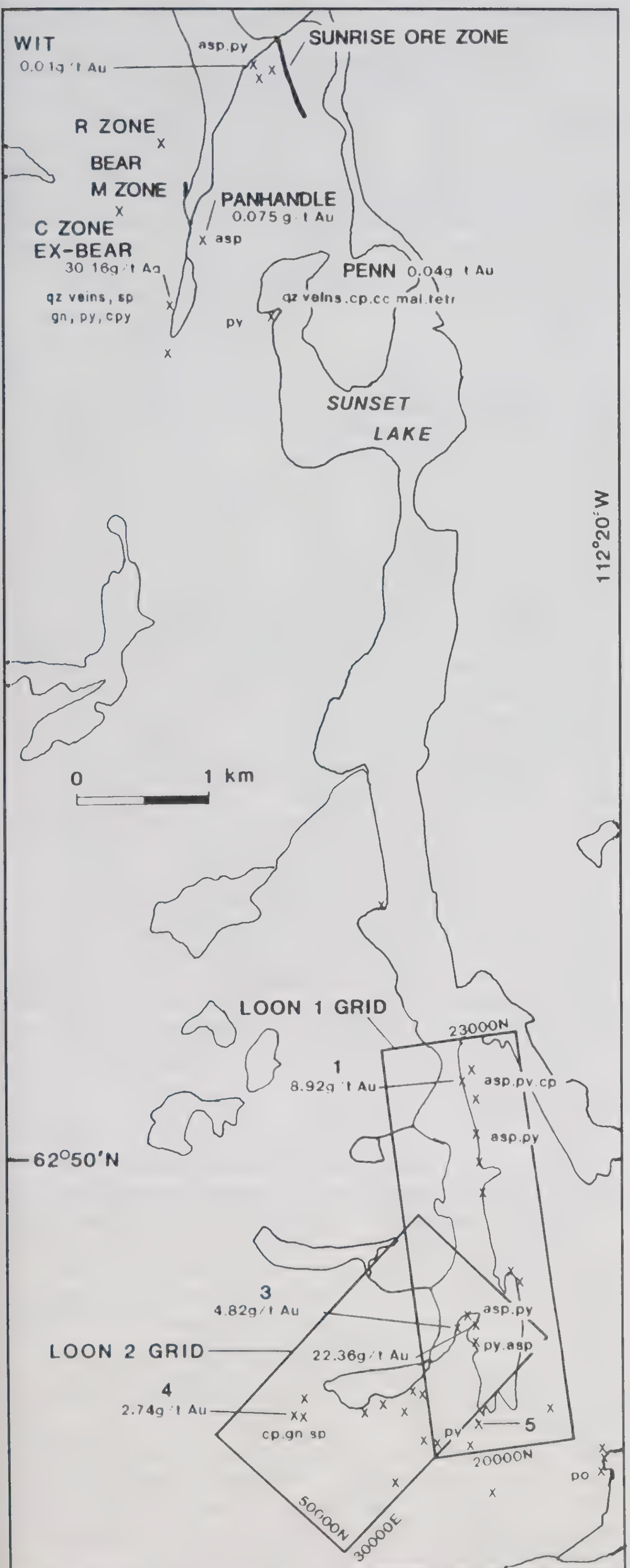


FIGURE 8-75: Sunset Lake area showings, assays and grids.

CURRENT WORK AND RESULTS

In 1986, ten holes, 542 m, tested the gold potential of silicified, brecciated, arsenopyrite-bearing quartz-biotite schists and massive pyrrhotite in iron formation of the C zone. Intersections assayed 10.6 g/t Au over 1.7 m, 5.3 g/t Au over 4.1 m, 7.0 g/t Au over 2.9 m and 6.8 g/t Au over 2.8 m. This was followed by 1:5000 scale geological mapping and prospecting along cut grids during which 79 rock samples were collected for gold assay, 6 were also assayed for silver and 2 for base metals and soil samples were collected which were analysed for gold, silver, lead, zinc and copper. Best gold assays came from a northeast-trending shear zone, the R zone, ranged up to 11.66 g/t Au. Assays from the massive sulphide M zone included 5.36% Zn, 1.6% Pb, 0.07% Cu, 48 g/t Ag, and 0.3 g/t Au (Fig. 8-75). Soil sampling delineated a 150 m long zinc-lead anomaly, a 50 m long silver anomaly and a patchy copper anomaly paralleling stratigraphy over the M zone.

Following the December 1987 announcement of the Sunrise polymetallic massive sulphide discovery on Aber/Highwood's adjacent claims and the realization that the BEAR claims probably host a fault extension of the Sunrise deposit, preparations were made to explore for volcanogenic massive sulphides.

GIVER CLAIMS

Giant Yellowknife Mines Ltd.	Gold
Bag 3000	85 I/15,16
Yellowknife, NWT, X1A 2M2	62°53'N, 112°30'W

REFERENCES

Henderson (1985); Lambert (1988).
DIAND assessment reports: 082551, 082729.

PROPERTY

GIVER 1-2.

LOCATION

The property is 113 km east-northeast of Yellowknife and extends from the northeast end of Giver Lake to Amacher Lake (Fig. 8-72).

HISTORY

The area was staked in 1964 to cover an aeromagnetic anomaly and a detailed airborne magnetic survey was flown in 1966. Giant Yellowknife Mines Limited staked the area as the GOOD 1-3 claims in 1979; however, the assays of 70 samples collected from various gossans and iron formations were low. GIVER 1 was recorded for Asamera Inc. in April 1985 when iron formation was recognised to be the source of the magnetic anomaly. GIVER 2 was added in July of 1985 to cover the projection of an iron formation between Giver and Amacher lakes. Work was done in 1985 by Kelmet Resources and in 1986 by Giant Yellowknife Mines as partners in joint venture with Asamera Inc.

DESCRIPTION

The property is underlain by north-northeast-trending amphibolite-grade metavolcanics of the Beaulieu volcanic belt intercalated with pyritic schists and magnetite-quartz iron formation. The volcanics are bordered on the west by cataclastic gneisses of the Sleepy Dragon Complex. Blue-grey, banded, locally folded, magnetite-quartz iron formation varies along strike from one to several parallel to subparallel units ranging up to 25 m in width. The aeromagnetic anomaly has a strike length in excess of 9 km. Within the volcanics numerous gossans have been called iron formation and have been prospected for gold. Gossans are up to 65 m long and up to 12 m wide and contain disseminated pyrite, pyrrhotite and minor chalcopyrite together with quartz.

CURRENT WORK AND RESULTS

Work done in 1985 is described here because it was filed after the 1984-85 Mineral Industry Report was written. Nine chip samples of pyrite-pyrrhotite-rich iron formation and 13 soil samples from two lines perpendicular to the magnetic anomaly that trends northeast between Giver and Amacher lakes were collected for analysis.

Work in 1986 focused on evaluating the gold potential of a drag-folded unit of banded sulphide iron formation on GIVER 2 called the BIF zone. Six trenches were excavated and nine samples assayed from trace to 0.69 ppm Au. Geologic mapping at 1:2000 scale showed that the outcrop pattern is complex and that two, and possibly three, iron formations crop out irregularly along a strike length of 175 m and across a stratigraphic width of 65 m.

SUNSET LAKE PROJECT

Noranada Exploration Co. Ltd. (N.P.L.)	Gold
4 - 2130 Notre Dame Ave.	85 I/16
Winnipeg, Man., R3H 0K1	62°50'N, 112°22'W

REFERENCES

Henderson (1985); Lambert (1988).

DIAND assessment reports: 017980, 061716, 080112, 081654, 081678, 081794, 081902, 082547, 082670.

PROPERTY

FIR 1-7, LOON, COWBOY, EX-BEAR and NORTH claims.

LOCATION

FIR 1-7 and LOON form a southern group of claims at the south end of Sunset Lake. A smaller northern group, at the north end of Sunset Lake, COWBOY, EX-BEAR and NORTH claims (Fig. 8-72), is just south of the Sunset volcanogenic massive sulphide deposit, 110 km east of Yellowknife.

HISTORY

The area has been prospected since the 1930's. In 1938 the Thompson Prospecting Syndicate discovered gold in the Alice shear zone and staked the ALICE 1-22 claims. The Alice shear is covered by LUCKY claim, 800 m north of the LOON claim. In 1945 Sunset Yellowknife Mines Limited acquired the ALICE claims, and between 1945 and 1947, 990 m were drilled (DIAND assessment report 061716) and a shaft was sunk on the Alice shear zone. Between 600 and 900 m of drilling from drifts on the 38-m level delineated an auriferous quartz shear zone cross-cutting cherty interflow sediments. It strikes north-northwest for 300 m and is less than 0.5 m wide. Giant Yellowknife Mines Ltd. optioned the property in 1966 and drilled 143 m in four holes on shears to the west of the shaft. The best intersection was 2.9 ppm Au across 0.46 m (DIAND assessment report 017980). In 1971 Teck Corp. and Great Plains Development had EM surveys flown over the area. In 1976 United Cambridge Mines Limited acquired the Alice property and conducted geophysical surveys (DIAND assessment report 080112). The area around the Alice shear zone was staked as the LUCKY claim by Mr. J. Arden in 1981 and was optioned to Ark la Tex Industries Ltd. in 1985 (DIAND assessment reports: 081675, 081654, 081794).

In 1983, Noranda staked a number of claims based on the 1971 airborne EM survey including FIR 1-7. In fall 1986, NORTH, LOON, COWBOY, and EX-BEAR claims were added following prospecting of felsic volcanic units and structural targets for gold.

DESCRIPTION

The two claim groups are underlain by dacitic to andesitic lavas, pillow breccias, tuffs, breccias, hyaloclastites and volcaniclastic sediments of the Alice Formation interbedded with rhyolite domes, flows and tuffs. Basaltic pillow lavas, breccias and volcaniclastic sediments of the Sunset Lake Basalt are also exposed. At the southern end of the claim block the volcanics are overlain by Burwash sediments. Metamorphic grade is dominantly greenschist with amphibolite-grade rocks on the southwest claims (Fig. 8-72). The rocks are isoclinally folded about north-trending fold axes and a later open fold with a northwest-trending axis is recognised in the southern claim block. In the northern claim group altered felsic volcanic rocks host pyrite, arsenopyrite and base metal showings including sphalerite, chalcopyrite and galena in quartz veins on EX-BEAR and chalcopyrite, malachite and tetrahedrite in quartz veins at the Penn showing on the NORTH claim (Fig. 8-75).

CURRENT WORK AND RESULTS

Both claim blocks were prospected and mapped during 1986 and several showings were sampled (Fig. 8-75).

FIR 1-7, LOON southern claim block: in 1987 two overlapping grids of 31.6 line-km were established over which winter geophysical VLF EM and magnetometer surveys were completed (Fig. 8-75). Conductors associated with magnetic anomalies were identified. Mapping of the grids found five showings (Fig. 8-75):

1. Frost-heaved boulders of sheared sericite schist are cross-cut by locally vuggy quartz veins with calcite, pyrite and arsenopyrite.
2. Sheared to talcose, carbonate-altered, mafic volcanics contain, on average, 3% and locally up to 15% fine pyrite disseminated along foliation planes and concentrated in vugs. The shear is adjacent to an oxide-facies iron formation.
3. A sheared, graphitic unit contains up to 50% pyrite as well as calcite and arsenopyrite.
4. Base metal showing contains chalcopyrite, sphalerite and galena.
5. Exposed in a trench at the south end of Sunset Lake, sheared volcanics similar to (2).

Further mapping was completed outside the grid areas.

NORTH, COWBOY, EX-BEAR northern claim group: four showings are identified (Fig. 8-75):

1. The EX BEAR showing is exposed in trenches where quartz stringers containing up to 5% sphalerite, 1% galena, 2% pyrite and 2% chalcopyrite cross-cut quartz-pyrite-sericite schist. Best assays for precious metals are 0.17 ppm Au, and 30.16 ppm Ag.
2. The Penn showing is stratabound. Felsic volcanics carry minor base metal sulphides and trace gold.
3. The Wit showing, adjacent to a sheared quartz-feldspar porphyry body, is hosted in rhyolite lapilli carrying 1% arsenopyrite and pyrite in the matrix. Gold assays range from nil to 0.010 ppm.
4. The Panhandle showing is a silicified zone within intermediate tuff or volcaniclastic sediment. The zone parallels a north-northeast-trending fault and contains acicular arsenopyrite. Assay results range from trace to 0.075 ppm Au.

SHEET 1 CLAIM

Asamera Minerals Inc.	Gold
2100, 144 - 4th Ave. SW	85 I/16
Calgary, Alta., T2P 3N4	62°52'N, 112°22'W

REFERENCES

Henderson (1985); Lambert (1988).
DIAND assessment report: 082530.

PROPERTY

SHEET 1.

LOCATION

The claim is 105 km east-northeast of Yellowknife, on the west side of Sunset Lake.

HISTORY

Part of the claim was staked in the mid-1940's as the GE, ALLAN and BEAR claim groups. No work was recorded and the claims lapsed. Asamera staked the SHEET claim in 1985 and exploration of the property is under joint venture with Kelmet Resources Ltd. and Giant Yellowknife Mines Ltd. During summer 1985 the claim was mapped at 1:15 840 and 57 rock and soil samples were assayed for gold and arsenic.

DESCRIPTION

The area is underlain by Beaulieu volcanic belt rocks comprising interbedded mafic flows, mafic tuffs and volcaniclastics of the Alice Formation and discontinuous felsic rocks.

CURRENT WORK AND RESULTS

The claim was mapped at 1:5000. Carbonate veinlets within sheared basalts and quartz-eye felsic tuffs were identified. South of SHEET 1 a highly fractured arsenopyrite-bearing and quartz-rich zone was discovered containing anomalous amounts of gold.

FEDED CLAIM

Noranda Exploration Co. Ltd.	Gold
4 - 2130 Notre Dame Ave.	85 I/16
Winnipeg, Man., R3H 0K1	62°47'N, 112°28'W

REFERENCES

Henderson (1985); Lambert (1988).
DIAND assessment report: 082587.

PROPERTY

FEDED.

LOCATION

The property is 100 km east-northeast of Yellowknife.

HISTORY

The gold showing was first staked in 1939 and has been staked and restaked several times as the FED and ED claim and prospected by trenching. The FEDED claim was staked by Noranda in May 1981, geologically mapped at 1:10 900 and prospected. In 1982 two grids were established over the auriferous quartz vein for control of 1:2000 scale mapping and sampling. Magnetometer, VLF EM and radiometric surveys were conducted over the grids.

DESCRIPTION

The western part of the property is underlain by pinkish grey, medium- to coarse-grained Amacher Granite, which intrudes mafic volcanics of the Sunset Lake Basalt exposed over the eastern part of the claim. Gold is in an east-trending quartz vein and silicified zone in the granite near the volcanic contact. The mineralised zone is 500 m long and up to 35 m wide and contains disseminated sulphides including pyrite, sphalerite, galena, chalcopyrite and pyrrhotite.

CURRENT WORK AND RESULTS

In 1987, 21 days were spent mapping and prospecting. Sixteen rock samples were taken, including ten from the quartz vein and six from the surrounding area. Assays ranged from trace to 2.53 g/t Au.

SHORTY Claim

Continental Pacific Resources
830, 355 Burrard St.
Vancouver, B.C., V6C 2G8

Lithium, Beryllium, Tin, Tantalum
85 I/11
62°33'N, 113°28'W

REFERENCES

Henderson (1985); Jolliffe (1944); Kretz (1968); Lasmaris (1978); Mulligan (1965); Wise *et al.* (1985).
DIAND assessment reports: 062264, 080274, 082128.

PROPERTY

SHORTY 1 (334.4 ha).

LOCATION

The property is 44 km east-northeast of Yellowknife and 1 km east of Hidden Lake (Fig. 8-76). The Ingraham Trail is 5 km south of the claim.

HISTORY

In 1975 Canadian Superior Exploration Ltd. evaluated the Greg showing, which had been trenched, and reserves were estimated to be 3.8 Mt grading 1.24% Li_2O to a depth of 160 m (DIAND assessment report 080274). The GREG claims lapsed and the showing was staked as the SHORTY 1 in December 1983.

DESCRIPTION

The pegmatite dyke, 390 m long, averaging 23 m wide, trends northeast and cross-cuts northwest-striking, steeply dipping, arenaceous to argillaceous beds of the Burwash Formation (Henderson, 1985). It is a simple pegmatite of quartz, feldspar, muscovite and spodumene with traces of cassiterite, tantalite and beryl. Ferrocolumbite is the dominant niobium-tantalum mineral, forming bladed crystals in cleavelandite + quartz + muscovite ± spodumene aggregates (Wise *et al.*, 1985).

CURRENT WORK AND RESULTS

In 1986 continuous chip samples, mostly 1.5 m long, were collected from seven trenches and analysed for lithium, beryllium, tin and tantalum. Grab samples were collected from the north end of the dyke, which has not been trenched. Results verified the tonnage and grade figures calculated by Canadian Superior (Table 8-7).

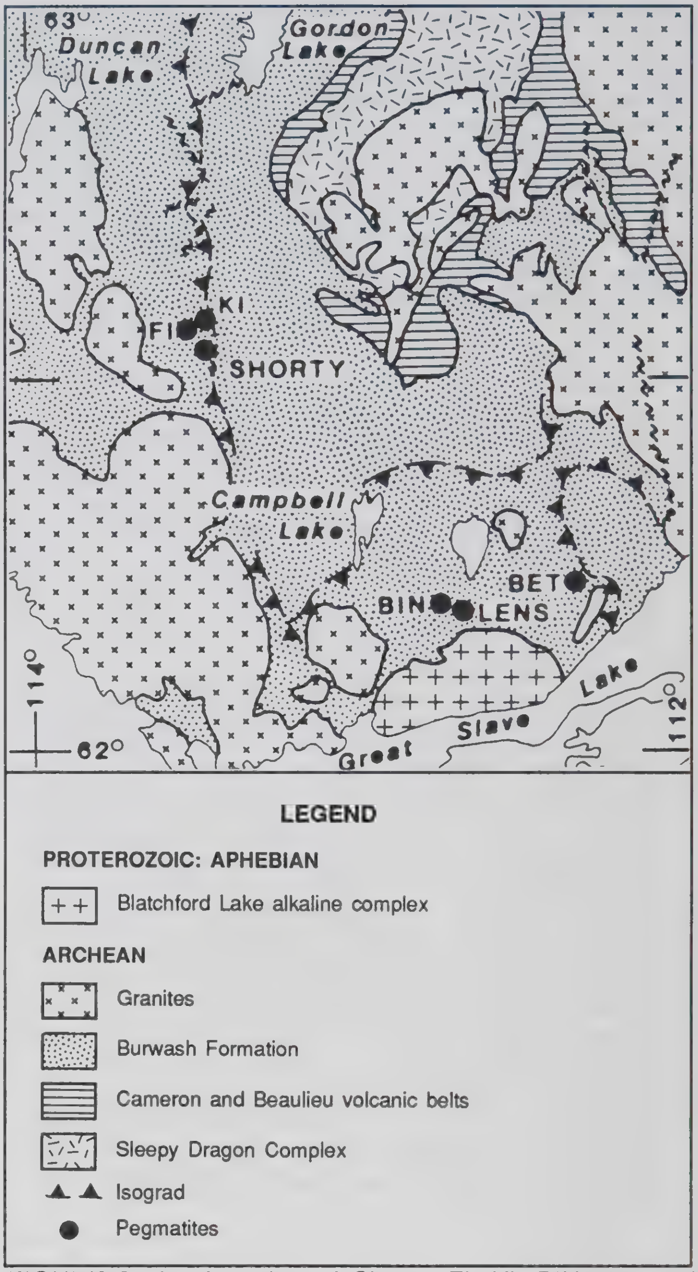


FIGURE 8-76: Location of Shorty, FI, KI, BIN, Bet and Lens pegmatites.

FI, KI Claims

Equinox Resources Ltd.
900 - 625 Howe St.
Vancouver, B.C., V6C 2T6

Lithium
85 I/11
60°35'N, 111°30'W

REFERENCES

Henderson (1985); Hutchison (1955); Jolliffe (1944); Kretz (1968); Lasmaris (1978); Mulligan (1965); Wise *et al.* (1985).
DIAND assessment report: 082495.

PROPERTY

Two separate blocks, FI lease, and KI lease and adjoining KI 6 claim.

TABLE 8-7: Reserves for pegmatites on the FI and KI claims

Pegmatite	Estimated Size (m)	Estimated reserve (Mt)	Grade (% Li_2O)
Bin[1]	122 X 12	0.09	1.75
Lens[1]	37 X 12	0.093	1.97
Bet[1]	100 X 9	0.039	2.00
Shorty (Greg)[2]	390 X 23	3.8	1.24
FI Main[2]	950 X 10-25	2.6	1.54
FI SW[2]	800 X 35	4.5	1.46
KI[2]	800 X 10-15	2.0	1.4

[1] Reserves from Lasmaris 1978. Calculations assume width and grade to 152 m depth.

[2] Reserves from assessment files. Calculations assume width and grade to 160 m depth.

LOCATION

Both properties are about 50 km northeast of Yellowknife. The FI property is 2.5 km northeast of Hidden Lake and the KI claims are 2.0 km northeast of the FI property (Fig. 8-76). The winter road to the Thompson-Lundmark gold mine passes through the western part of the FI property.

HISTORY

In 1956, General Lithium Corp. optioned the FI Southwest Dyke and carried out trenching and 258 m of diamond drilling. The FI Main Dyke was held by Affiliated Lithium Mines Ltd. at that time. In 1975, Canadian Superior Explorations Ltd. began exploration on the FI and KI properties as part of a regional evaluation of pegmatites in the Yellowknife region. Both properties were mapped and sampled in detail. In 1978, three holes, 234 m, were drilled to test the KI property. In 1979, six trenches were blasted on the FI Main Dyke and were sampled as were trenches on the FI Southwest Dyke. Reserves of the FI Southwest Dyke, the FI Main Dyke and the KI are reported in Table 8-7.

The property was acquired by Erex International Ltd. and in 1985 by Equinox Resources Ltd. who holds a 49% interest in the FI and KI properties under the terms of a property sale and option agreement. The KI 6 claim was added to the KI property in 1985.

DESCRIPTION

Pegmatite dykes on FI and KI are simple pegmatites of feldspar and quartz, with lesser spodumene, the principal lithium mineral. They are hosted by nodular quartz-biotite schist of the Burwash Formation. The FI property contains two large pegmatite dykes:

1. The FI Southwest Dyke (Table 8-7) forms a 5 to 10 m high ridge approximately 35 m wide and is easily traced on surface for 800 m. The dyke strikes 30° and dips vertically. Contacts are sharp and are marked by a 0.3-0.5 m wide chill zone. Within the dyke alternating bands of aplite and pegmatite are common; the western side of this dyke has a higher proportion of aplite. Pegmatite contains most of the spodumene as subparallel crystals 5-10 cm long. The spodumene content of the Southwest Dyke averages 20% decreasing to about 10% in its northern third. The northern part of the Southwest Dyke contains up to 30% hornfels rock fragments, concentrated along the eastern margin.
2. The FI Main Dyke (Table 8-7) can be traced for 950 m and has a maximum thickness of 25 m, decreasing to about 10 m in the narrowest parts of the southeast limb. Overall, the mineralogy and lateral banding of the Main Dyke are very similar to the FI Southwest Dyke, but with more variation in the spodumene content. The narrow dykes extending southeast of the main dyke are more aplitic and have a lower spodumene content.

On the KI claim, the KI Dyke (Table 8-7) crops out over an 800 m northwest strike length, is 10-15 m wide, dips steeply south and contains 20-25% spodumene, with minor muscovite.

CURRENT WORK AND RESULTS

In January 1987, 1380 kg of pegmatitic material was collected by blasting on the FI Southwest pegmatite, the FI Main pegmatite and the KI pegmatite. Metallurgical testing of the material by Bacon, Donaldson and Associates Ltd. indicated that a spodumene concentrate could be produced by a combination of gravity concentration and floatation. Tests to produce a lithium carbonate product demonstrated that a high purity product could be made using the roast and acid leach method. Potential by-products were also investigated. It was found that mica, feldspar and sodium sulphate could be produced.

Initial whole rock analysis and grindability tests performed on the samples indicated that there was very little variation between samples. Within the areas of calculated reserves considered for development, assays averaged 1.46% Li_2O with little variation.

BIN 1, BET 1, 2 AND LENS 1 Claims

Equinox Resources Ltd.	Lithium, Niobium,
900, 625 800 Howe St.	Tantalum
Vancouver B.C., V6C 2T6	85 I/1,2
	62°13'N, 112°45'W
	62°13'N, 112°18'W
	62°12'N, 112°41'W

REFERENCES

Lasmaris (1978); Seaton (1978); Henderson (1985); Wise *et al.* (1985).

DIAND assessment reports: 080278, 080279, 080280, 081132, 081875, 081877, 081878.

PROPERTY

Three separate claim blocks, BIN 1 (18.6 ha), LENS 1 (21.7 ha) and BET 1 and 2 (42.8 ha).

LOCATION

The claim groups are 87 to 112 km south-east of Yellowknife (Fig. 8-76).

HISTORY

Work prior to 1975 is summarised by Seaton (1978). Pegmatite on the BET claims was mined intermittently between 1947 and 1954 for tantalum and lithium under the name BEST BET. BIN 1, LENS 1 and BET 1 and 2 were staked in 1975 for Canadian Exploration Ltd. during a regional evaluation of pegmatites (DIAND assessment reports: 080278, 080279,

080280). In 1980, BET 1 and 2 were transferred to Cominco Ltd. who conducted geochemical testwork (DIAND assessment report 081132). In 1985, the three claim groups were transferred to Equinox Resources Ltd.

DESCRIPTION

The claims are underlain by pelitic and psammitic schists of the Burwash Formation. The pegmatites are simple spodumene-bearing types. The Bin pegmatite also contains cassiterite and the Bet pegmatite ferrocolumbite and ferrotantalite.

CURRENT WORK AND RESULTS

Old trenches were cleaned out to examine exposures for tantalum-bearing minerals.

INDIAN MOUNTAIN LAKE - BENJAMIN LAKE SUPRACRUSTAL BELT

The Indian Mountain Lake - Benjamin Lake supracrustal belt extends 65 km north from the east arm of Great Slave Lake. It has a maximum width of 25 km at its southern end and tapers northward to a sinuous "tail" of metasediments at its northern end. The belt is flanked by granitic and migmatitic rocks. Volcanic rocks include two contiguous belts on the west shore of Indian Mountain Lake and extending north 20 km, and another belt 20 km long from Great Slave Lake, west of Suse Lake and north 20 km. The area was mapped by Henderson (1944) and by Stockwell and others (1968) at 1:253 440, and that part covered by NTS 75 M/2 by Heywood and Davidson (1969) at 1:50 000.

The region has been extensively prospected for base metal deposits since the late 1940's and numerous small showings of zinc, copper and silver have been located in the volcanics and sediments. Indian Mountain Metal Mines discovered BB and Kennedy Lake zones in 1948 and Susu Lake zone (Fig. 8-77) in 1966.

BRI and GYM

Giant Yellowknife Mines Ltd.	Gold
Bag 3000	75 M/2
Yellowknife, NWT, X1A 2M2	63°07'N, 110°55'W

REFERENCES

Heywood and Davidson (1969); Johnson (1974).
DIAND assessment report: 082488.

PROPERTY

BRI 1-7, GYM 1-4.

LOCATION

The claims are 195 km east-northeast of Yellowknife in the Brislane Lake - Indian Mountain Lake area, about 25 km north of Thompson Landing on the east arm of Great Slave Lake.

HISTORY

The area was explored for base metals in the late 1940's by Indian Mountain Metal Mines and Initiative Exploration Ltd. The area was again explored for base metals during 1955-65 and 1970-74. The BRI and GYM claims were staked in 1986 to cover a syngenetic gold target identified in 1985 samples of old core on BRI 1 which returned encouraging assays. The BRI 1 claim covers three copper-zinc zones previously delineated by Indian Mountain Metal Mines. The BB Lake and Kennedy Lake base metal zones are just south of the claims. The BRI and GYM claims are under a joint venture agreement between Giant, Asamera Minerals Inc. and Kelmet Resources Ltd.

DESCRIPTION

North-trending massive and pillowed flows are overlain by a narrow band of andesitic to dacitic flows and tuffs and a thick sequence of felsic flows, tuffs and fragmentals. These are, in turn, overlain by quartz-biotite-cordierite schists representing metasediments. The Indian Mountain Lake belt is draped around a tonalite body. The claims cover a large portion of the volcanic-sediment contact east (Brisbane Lake) and west (Indian Mountain Lake) of the tonalite, as well as numerous base metal sulphide showings, mainly pyrite, pyrrhotite, chalcopyrite, sphalerite and galena, within the felsic pyroclastic and carbonate formations. Rocks are metamorphosed to amphibolite grade and in the southern part of the property are strongly tectonised and migmatised. Three felsic fragmental domes, which form hills, are recognised on the property. These were eruptive centres and are flanked by thick sequences of laterally fining felsic fragmentals and volcaniclastics. The fragmental sequence has been intensely carbonatized, and coarsely crystalline carbonate units previously described as limestone or carbonate exhalite were re-interpreted to represent severely altered felsic volcanics.

CURRENT WORK AND RESULTS

In May 1986 a DIGEM III electromagnetic/resistivity/magnetic survey with 100 m line spacing was flown over the claims. Numerous magnetic and conductive anomalies were outlined which corresponded to massive sulphide showings and large areas of disseminated pyrite and pyrrhotite. Three areas selected as potential gold targets were characterised as having an anomalous magnetic signature and having variable but generally high total field VLF EM and low resistivity. The targets are on the east side of Brislane Lake, south of the narrows and on the south and west shore of Brislane Lake including the Taco Islands.

In 1986 geologic mapping of the property at 1:10 000 was completed together with collection of 109 samples for lithogeochemical analysis. During prospecting 422 grab, chip and channel samples were collected, including samples from 2 newly blasted trenches and from 5 old trenches. The core drilled in 1974 was re-logged and sampled. From these assays it was observed that gold enrichment is associated with chalcopyrite and pyrite. Four grids were established for a soil geochemical survey. Of the 2125 soil samples collected, only 201 which were from areas with coincident geophysical anomalies were analysed for gold, arsenic, tin, tungsten, copper and zinc.

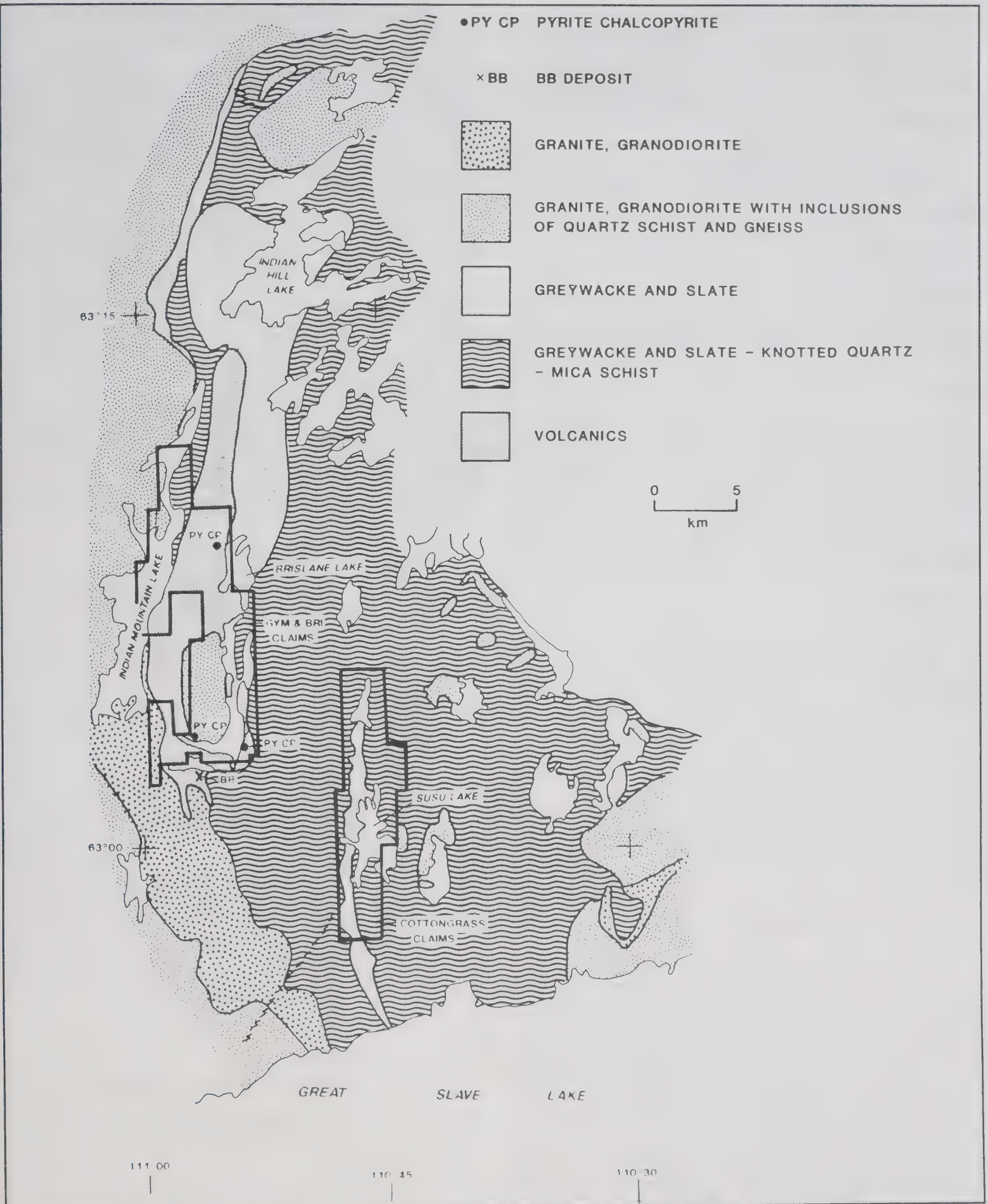


FIGURE 8-77: *Geology, showings and claims where 1986-87 work is recorded for the Indian Mountain supracrustal belt.*

COTTONGRASS

BHP-Utah Mines Ltd.
1600 - 1050 W. Pender St.
Vancouver, B.C., V6E 3S7

Gold, Base Metals
75 L/15; 75 M/2
63°-63°05'N
110°48'-110°44'W

REFERENCES

Heywood and Davidson (1969).
DIAND assessment report: 082714.

PROPERTY

COTTONGRASS 1-6.

LOCATION

The claims are on Susu Lake, 200 km east-northeast of Yellowknife and 20 km north of Great Slave Lake.

HISTORY

The area has been extensively prospected since the late 1940's. The Susu Lake copper zone, 800 m west of the claim block, was discovered in 1966 by Indian Mountain Metal Mines. The COTTONGRASS claims were recorded in October 1986 by BHP-Utah Mines Ltd. following 1986 reconnaissance mapping and sampling which found anomalous gold and base metal content in 49 rock chip samples collected along a mineralised rhyolite-metagreywacke contact in the Indian Mountain belt.

DESCRIPTION

The property covers part of the Indian Mountain volcanic belt (Fig. 8-77; Heywood and Davidson, 1969). The rocks are believed to be metamorphosed equivalents of rhyolite, limestone and felsic breccia now represented as a 9.7 km long lens of fine-grained, massive to weakly foliated, quartz-feldspar-biotite granulite locally interbedded with calcsilicate, and hornblende-garnet granulite. These are enclosed by quartz-biotite schists and quartz-biotite-cordierite-knotted schists representing metamorphosed greywackes. The metasediments are isoclinally folded and quartz veined. In all units foliation strikes 135°-165° and dips 45°-60° east. Two dextral strike slip faults cross-cut the area with carbonate fault breccias and siliceous mylonite surrounded by alteration zones tens of metres wide.

CURRENT WORK AND RESULTS

In 1987, 36 days were spent on the property. An 18.7 line-km flagged grid was established over the metasedimentary-metavolcanic contact and total field magnetometer and VLF EM surveys were conducted over the grid totalling 15 line-km and 13 line-km respectively. The property was geologically mapped at 1:5000 scale and 83 rock and 5 soil samples were collected. Highest results were 950 ppb Au, 2059 ppb Zn, 2611 ppm Cu, and 4015 ppm Pb. Anomalous concentrations of gold, copper and zinc were traced sporadically for 9 km within 20 m of the eastern volcanic-sedimentary contact. Close to the contact, within the metasediments, foliation is typically more pronounced and quartz veining is more intense. Quartz veining and silica flooding with disseminated to massive pyrite, pyrrhotite, sphalerite and chalcopyrite is typical of calcsilicate rocks interbedded with the rhyolite at the sediment contact.

COURAGEOUS LAKE-MACKAY LAKE VOLCANIC BELT

The Courageous Lake-MacKay Lake volcanic belt is 240 km northeast of Yellowknife. It is a steeply dipping, east facing, homoclinal succession of north-northwesterly trending volcanic rocks and sediments, 70 km long and 2 to 7 km wide. The belt is conformably overlain by tracts of turbiditic sediments to the east and bounded by granitoid intrusions to the west. Metamorphic grade is greenschist facies increasing to amphibolite facies near the volcanic-granitoid contact.

GSC mapping of the Courageous Lake-MacKay Lake volcanic belt at 1:253 440 scale was by Henderson (1944) who completed the MacKay Lake sheet and Folinsbee (1949) who completed the Lac de Gras sheet. The Courageous Lake-Matthews Lake area was mapped by Folinsbee and Moore (1950) and Moore (1951) at 1:18 000 scale and by Moore (1956) at 1:24 000. Moore's 1956 coverage was extended to the north and south in 1978 and 1979 by Dillon-Leitch (1979, 1981, 1984), sponsored by DIAND.

Moore (1956) and Dillon-Leitch (1981) have described the Archean Yellowknife Supergroup rocks of the Courageous Lake-MacKay Lake area in detail: Two cycles of volcanism are recorded, Cycle One and Cycle Two (Table 8-8; Dillon-Leitch, 1981). Cycle One and Two basalts range in thickness from 1 to 5 km and comprise massive, pillowed and locally feldspar-

TABLE 8-8: STRATIGRAPHIC SUCCESSION IN THE COURAGEOUS-MACKAY LAKE AREA, after Dillon-Leitch (1981).

PROTEROZOIC
- **Diabase**
- **Great unconformity**
- **Pegmatite**
- **Granite**
- **Intrusive contact**

ARCHEAN
- **Yellowknife Supergroup**
  - **Turbidites:**
    - greywacke and slate
    - granitoid and volcanic conglomerate
    - volcanogenic chert
  - **CYCLE 2**
    - Rhyolite to dacite:
      - domes or massive flows
      - volcaniclastics
      - quartz-feldspar intrusions
    - Andesite:
      - massive flows, pillowed flows
      - volcaniclastic breccia
    - Basalt:
      - massive flows, pillowed flows
      - feldspar phyric massive flows
      - feldspar phyric pillowed flows
      - flattened pillows
  - **CYCLE 1**
    - Rhyodacite:
      - breccia
      - intervolcanic conglomerate ± mudstone
    - Basalt:
      - massive flows, pillowed flows
      - minor pillow breccia
- **? Unconformity ?**
- **Basement ?**
  - Granodiorite
  - Tonalite
  - Trondhjemite

phyric basalt flows. Massive flows, predominant in the northern part of the belt, are up to 200 m thick and laterally continuous for up to 3 km. Pillowed flows are found in the southern part of the belt. Pillow breccias and hyaloclastites are found locally, but are poorly preserved, commonly deformed and difficult to recognize. Pillowed flows range from 50 m to greater than 250 m thick, although estimates may be exaggerated where pillow-breccia units are not recognized. Porphyritic basalts form lenses of feldspar-phyric massive and pillowed flows 100 to 200 m thick, concordant to the north-striking regional schistosity.

Amygdaloidal andesites, exposed in the northern part of the belt, are restricted to Cycle Two. Pillowed flows, and subordinate massive flows and rare volcaniclastic breccias are intermixed with basalts. Massive flows range from 30 to 50 m and pillowed flows are up to 200 m thick. Breccias are laterally discontinuous, up to 200 m thick and contain ash to lapilli size, flattened fragments.

Felsic volcanics range from locally vesicular massive rhyolitic flows, predominant in Cycle One, to rhyolitic and dacitic pyroclastics represented in Cycle Two. Facies changes are rapid. Massive flows up to 600 m thick, grade vertically and laterally into agglomerates 5 to 100 m thick and lapilli tuff 50 to 200 m thick. Fragmental units are commonly monolithic but fragments can show differing internal textures such as vesicular to non-vesicular and quartz- or feldspar-phyric. In many places, fragments are flattened, elongated, poorly sorted and exhibit internal fracturing.

Intervolcanic sediments comprise slaty mudstones to biotite phyllites, 10 to 100 m thick and polymictic conglomerates, 30 to 50 m thick. Mudstones are thinly laminated on a scale of millimetres and contain abundant euhedral pyrite. They are found within Cycle One volcanics near the granitoid contact and minor amounts occupy the top of Cycle Two, less than 1 km from the upper volcanic-sediment contact. North of Courageous Lake, mudstone is overlain by a unit of conglomerate 1.5 km in strike length. Thin pyritic cherty layers in the south and eastern portions of the belt are thought to represent the close of volcanism and possible exhalitive activity (Dillon-Leitch, 1981). The belt grades into proximal-basin facies turbiditic sediments derived from the felsic cap of the volcanic pile.

Dillon-Leitch (1981) cites evidence of four phases of regional deformation. The east-facing homocline and marginal synclines developed during the first phase of deformation, possibly resulting from the intrusion or remobilization of granitoid bodies to the west. Three subsequent phases of sub-horizontal compressive deformation imposed steeply north plunging tight to isoclinal F_{0A} folds in the sediments, east to northeast F_{0B} folds near the southeast pluton and open to tight, moderately to subvertically northwest plunging F_2 folds. A pervasive regional foliation trends 330° to 355° and dips steeply.

Gold was first discovered in 1939 by Territorial Exploration Ltd. field parties, under the direction of Dr. W.L. Brown. Brown mapped north and south of Courageous Lake and discovered a number of showings including the T.M.K. vein. The vein assayed 67.8 ppm Au across 50 cm for a strike length of 35 m (DIAND assessment report 082385). In 1946, Tredway Gold Mines Ltd. drilled 379 m to test the vein, but results were inconclusive.

From 1943 to 1945 exploration centred on the Courageous Lake area and the W.A., MINT (discussed under the MOG claims), TARTAN, O.K., ARCTIC, K.B., J.B., and F.N. groups were recorded (DIAND assessment report 082385). In 1943 the Newnorth South and North properties were staked by Austin Dumond on either side of the T.M.K. group and were acquired by Newnorth Gold Mines Ltd. in 1945. The South Group was explored by trenching and three diamond-drill holes totalling 86 m. The North Group was explored by trenching and 725 m of diamond drilling. Five gold showings including the Sour Lake and Jax showings were discovered on the North Group. During the mid 1940s, exploration expanded to the south. The Saucer Lake and Perrson vein showings, auriferous quartz veins containing arsenopyrite, pyrite and pyrrhotite, were discovered and staked as the ROMA and JEJA claims in 1945.

In 1945 JEJA 1-6 were staked by J. Matthews and SALERNO 1-8 were staked by F. Salerno and M. Mitto to protect auriferous quartz veins on the east and south side of Matthews Lake respectively. Salmita Northwest Mines Ltd. was incorporated in late 1945 to develop the SALERNO property. The JEJA claims were subsequently optioned by Trans-American Mining Corporation who added REP 1-12 and MAD 1-18 to the group and formed Bulldog Yellowknife Mines Ltd. in 1947 to hold the claims.

The two properties were sporadically developed after the 1940s. The southern gold showing was brought into production as the Tundra Mine. Between 1964 and 1968 the Tundra Mine produced 3251.5 kg of gold and 644.5 kg silver from 170 285 t of ore. The Salerno gold showing became the Salmita Mine, which operated from 1983 to 1987 and produced 5624.3 kg of gold and 1015.1 kg of silver from 216 627 t of ore (Caine, 1987).

The Red 24 claim, immediately south of the Tundra Project discussed in this section and approximately 3.5 km north of the Salmita Mine, was staked in 1973. Drilling on the claim between 1983 and 1985 outlined 13 000 t grading 19.5 ppm. A pit was excavated in 1986 and 5700 t of refractory ore grading 18.1 ppm were mined from four benches. Mining was discontinued as poor recovery rates (65%) made it uneconomic to mine the remaining 7200 t of ore, accessible only from underground. In 1987, Giant Yellowknife Mines and joint venture partners, Giant Bay Resources, completed a 10 tpd bioleach test (see Chapter 2; NMI, 76 /3 Au1).

Most gold deposits can be grouped into two types: One type is auriferous shear zones with finely disseminated sulphides, including arsenopyrite (Tundra Project; Secum and KM groups; ALPHA group; T.M.K. groups). The other type is auriferous siliceous zones/quartz veins with 3 to 5% sulphide (T.K. BS claims; MINT group; Kennedy showings, Newnorth south group; Jax Lake) at the volcanic-sediment contact (Matthews vein, Tundra Mine; Salmita Mine), or within the volcanics (South zone, Tundra Mine). The majority of gold deposits are found in Cycle Two felsic volcanics usually within 700 m of the volcanic-sediment contact (Ransom and Robb, 1986). Ground magnetic and IP surveys have detected swarms of linear anomalies coincident with zones of disseminated sulphides in the upper felsic volcanic cycle.

In 1976, regional exploration for base metals by Noranda Exploration included reconnaissance and an airborne EM survey of the belt. By the late 1970s, Noranda delineated three polymetallic volcanogenic massive sulphide deposits, the Deb, Ptarmigan and Grizzly. Drill testing of the Deb deposit indicated 1 015 000 t of 0.83% Cu, 2.96% Zn and 21.9 ppm Ag (NMI 75 M/14 Cu3). The deposits are hosted by sulphide accumulations in Cycle One rhyolite lapilli tuff. Geophysical surveys of the area indicate a conductive trend associated with the massive sulphide zone (Ransom and Robb, 1986).

STAR FISH LAKE PROPERTY

Pronto Exploration Ltd. — Gold
1104, 555 Yonge St. — 76 D/5
Toronto, Ont., M5E 1J4 — 64°17'2"N, 111°42'7"W

REFERENCES

Folinsbee (1949).
DIAND assessment report: 082715.

PROPERTY

BARB 1-3 (F14276-F14278).

LOCATION

The claims are at Star Fish Lake 225 km north northeast of Yellowknife.

HISTORY

No prior work has been recorded for the area.

DESCRIPTION

An outlier of Archean volcanics and sediments outcrop at the north end of Star Fish Lake (Fig. 8-78). Bedding and foliation strike northwest to north-northwest and dip steeply southwest. Volcanics and sediments are surrounded and cut by granitic intrusions and all rocks are cross-cut by north-northwest-trending Proterozoic diabase dykes.

CURRENT WORK AND RESULTS

BARB 1-3 were staked in 1987. A 315 line-km VLF EM, EM and magnetometer survey was flown in 1987, orientated 040° with 100 m spacing. A series of VLF EM and EM conductors with coincident magnetic anomalies were defined. Conductors and anomalies were correlated with a linear mafic intrusion. A pronounced VLF EM conductor at the west end of Starfish Lake, not coincident with any other geophysical responses, was thought to relate to a structure controlling the shore line.

JAX LAKE PROJECT

Aber Resources Ltd. — Gold
Highwood Resources Ltd. — 76 D/6
700, 1177 W. Hastings St. — 64°20'N, 111°24'W
Vancouver, B.C., V6E 2K3

REFERENCES

Curry (1961); Moore (1956).
DIAND assessment reports: 017118, 016458, 080162, 081495, 082155.

PROPERTY

APA 70 (Lot 001, 88 a); BUMPS LTD. -2; DW , 4, 5, 13-18, 19-33; PRN 9 (Lot 000, 924 a); INK 1-2 (690 ha); NOV 2-3 (1134 ha).

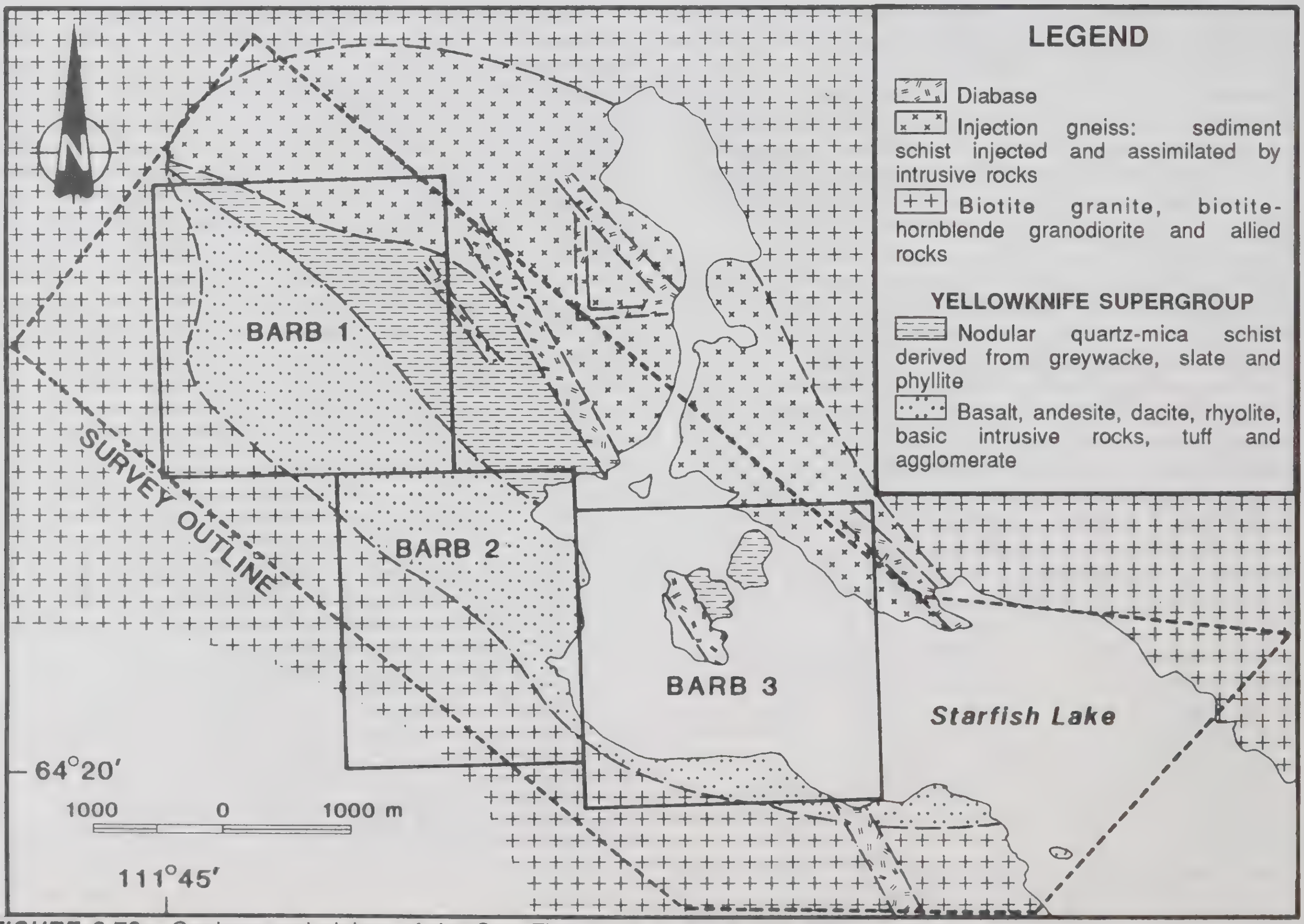


FIGURE 8-78: Geology and claims of the Star Fish Lake area (after Folinsbec, 1949).

LOCATION

The property is centred on Jax Lake, 250 km northeast of Yellowknife (Fig. 8-79).

HISTORY

The area was acquired by Newnorth Gold Mines Ltd. in 1945 and explored in 1959 by trenching and 725 m of diamond drilling. The claims lapsed and the ground was restaked by the Big Four Syndicate in 1959 and 1960 as the FIX and JAX groups. Targets, including the Jax 1 and 2 zones were drilled, and other showings including the Jax 3 and 4 zones were trenched. The JAX and FIX groups were brought to lease, but the lease lapsed and the area was restaked as the DW claims in 1972. The claims were acquired by Savanna Creek Gas and Oil Ltd. and were transferred to Golden Ram Resources Ltd. in 1973. Overburden stripping, trenching and sampling by Golden Ram in 1974 showed gold concentrations in the Jax 1 and Jax 2 zones were less erratic at depth than at surface. Further drill testing of the Jax 1 and Jax 2 zones outlined 36,000 t grading 13.7 ppm gold. The claims were transferred to American Chromium Ltd. (then Perry River Nickel Mines Ltd.) in 1981 who also acquired BUMPS LTD. 1-2, PRN 69 and APA 70. A lease (Lots 1000, 1001) was granted on these properties in 1982. INK 1-2 were staked in 1983 and transferred to American Chromium in 1984. A 150 line-km grid was established over the Jax property during the winter of 1985 as control for magnetometer and VLF EM surveys. Work on American Chromium's leases was done by Highwood Resources and an affiliated company, Aber Resources Ltd., under the terms of an option agreement.

DESCRIPTION

Volcanic rocks west of Jax Lake are conformably overlain to the east by sediments including greywacke, argillite and metamorphosed equivalents. Mafic volcanic rocks predominate and include massive and pillowed flows. A schistose banded unit is formed from recessive-weathering layers of carbonate and felsic tuff. Massive felsic flows and pyroclastic units occupy several stratigraphic levels. An extensive exposure of massive, fine-grained and commonly quartz-feldspar-porphyritic flows, 1 km west of Jax Lake, can be traced the length of the property. Volcanics form a north-trending valley-and-ridge system interrupted by east-trending drift-filled valleys, possibly the surface expression of fault zones. North-trending valleys are underlain by felsic volcanics and ridges are formed by mafic volcanics cut by gabbro intrusions. Gabbro and diorite sills and dykes intrude near contacts between massive mafic flows and the mafic schistose banded unit. The volcanic-sediment contact forms a depression occupied by lakes and swamps. Two north-northwesterly trending Proterozoic diabase dykes intrude all rocks on the property.

CURRENT WORK AND RESULTS

INK 1-2 was transferred to Highwood Resources in 1986. In 1986, the grid was refurbished and extended to the north. A regional magnetometer survey helped define major lithological units. A zone of felsic rocks 1 km west of Jax Lake has a distinctly flat magnetic signature traceable the length of the property and subdivides the mafic volcanics into two cycles. A transition zone of mafic flows, tuffs and minor silicate-facies exhalite overlying the felsic zone exhibits a disjointed magnetic signature. The zone is overlain by Cycle Two mafic flows having a magnetic signature comparable to similar rocks in Cycle One. The best-defined magnetic features on the grid are two north-northwest-trending diabase dykes.

Detailed magnetometer, VLF EM and SP surveys were completed over select areas. Three separate zones, commonly containing multiple, laterally extensive, VLF EM conductors were defined, which are related to silicate-facies iron formation,

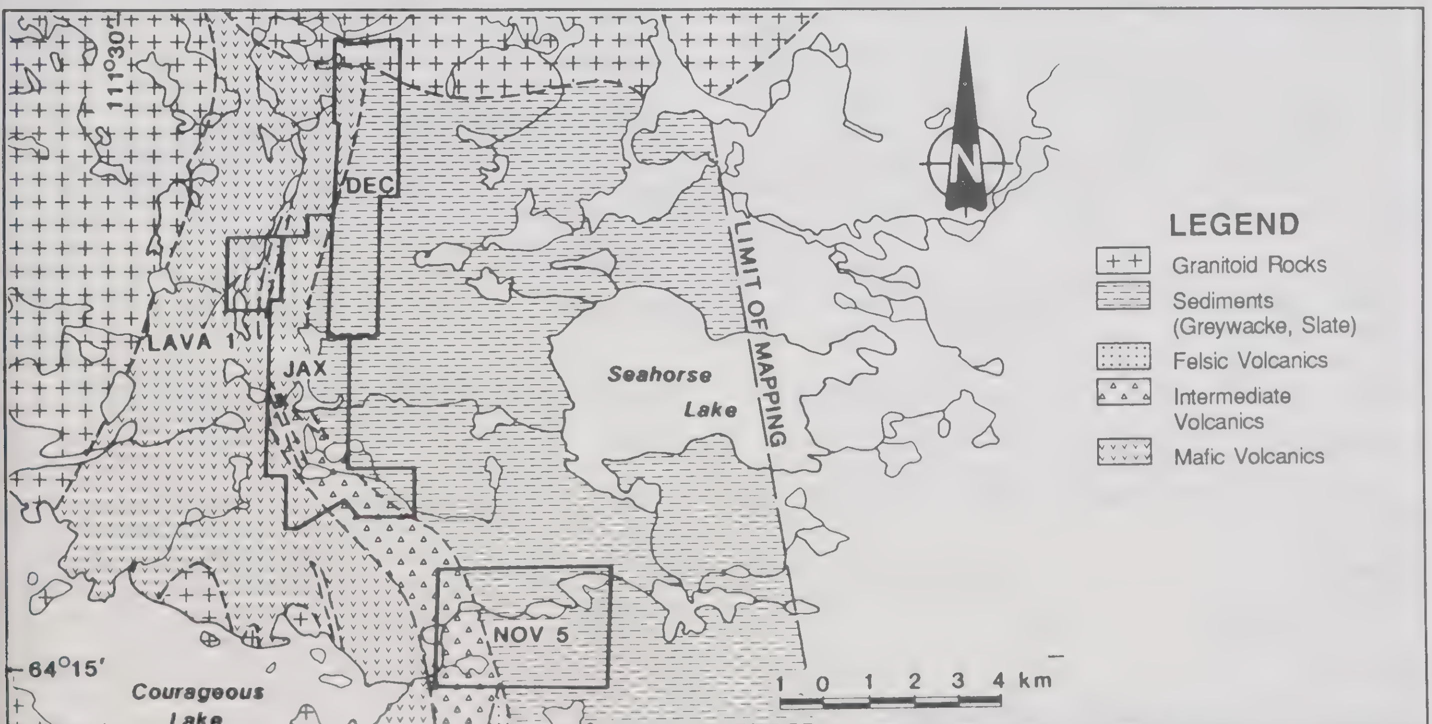


FIGURE 8-79: Geology and claims of the Courageous Lake-MacKay Lake volcanic belt, north sections (after Dillon-Leitch, 1981).

graphite and pyritic felsic tuffs. The transition zone, separating Cycle One and Two rocks is characterized by several linear trends, again related to silicate iron formation and graphite. The third zone defines the contact between volcanic rocks and overlying sediments.

The SP survey was carried out over 8.4 km of the central Jax Lake grid. Several graphite zones were discovered with variable and discontinuous response between lines. A broad feature 20-30 m wide is thought to be gabbro containing magnetite and possible disseminated sulphides. Responses on the eastern portion of the grid are relatively flat with several weak and sporadic anomalous areas.

Reconnaissance geological mapping was done to augment previous 1:4800-scale mapping done by the Big Four Syndicate. The Jax 1 to 4 and Sour Lake showings were evaluated, geophysical anomalies were ground checked and 136 grab samples were collected. Only 12 contained more than 100 ppb Au, and 11 of these were from the five showings.

Both the Jax 1 and 2 zones are at the contact between massive mafic lavas and schistose volcanic rocks. The Jax 2 zone, traced over a 250 m strike length, is two major sub-parallel quartz veins and associated stringers up to 1.8 m wide. Sulphides, including pyrrhotite, arsenopyrite, pyrite, chalcopyrite and sphalerite, comprise up to 10% of the wallrock and 2% of the quartz veins. Native gold and associated sulphides occupy fractures within the quartz. The Jax 2 zone traced by diamond drilling over a 60 m strike length, displays similar mineralogy to the Jax 1 vein system. The Jax 1 and 2 zones, while not associated with any VLF EM trends, are flanked by two strong formational conductors. The Jax 2 zone displays a weak coincident magnetic association with several weak, positive south-trending anomalies flanking the gold zones. The SP survey over the Jax 2 zone defined a weakly conductive feature extending about 80 m.

The Jax 3 zone, three parallel vein systems, is exposed over a 7.6 m wide interval. The veins are within shear zones cutting massive mafic volcanics. The zone is not associated with a VLF EM anomaly, however, it flanks a major conductor and is close to a major break in the conductor. The SP survey defined several continuous narrow structures flanking a major graphitic zone. This zone runs directly through the Jax 3 trench and may indicate an extension of this zone to the north.

The Jax 4 zone is quartz stringers with minor arsenopyrite and pyrrhotite within schistose volcanic rocks. The zone appears to flank and may be associated with a break in a VLF EM anomaly and is coincident with a strong magnetic anomaly.

LAVA CLAIM

Eugene Luczkiw	Gold
c/o Suite 2042, 3080 Yonge St.	76 D/6
Toronto, Ont., M4N 3N1	64°20'N, 111°25'W

REFERENCES

DIAND assessment reports: 080734, 080908, 081126, 082528.

PROPERTY

LAVA 1 (F10312).

LOCATION

The claim is 250 km northeast of Yellowknife and 8 km north of the north end of Courageous Lake. It is immediately northwest of the area of the old JAX claims (Fig. 8-79).

HISTORY

The history for the area is described under the Jax Lake Project.

DESCRIPTION

The claim is underlain by mafic massive and pillowed flows and agglomerate. Felsic flows, tuffs and agglomerate outcrop along two north to northeast-trending narrow belts in the central and northeast central portion of the claim. Rusty zones within mafic volcanics are interpreted as interflow exhalative units (DIAND assessment report 082528). Zones are commonly siliceous and contain up to 30% combined pyrite and pyrrhotite. Similar rusty zones within felsic volcanics, adjacent to contacts, contain up to 15% combined pyrite and pyrrhotite and may be intraformational exhalites.

The volcanic rocks are cut by a north-trending gabbro dyke in the central portion of the property and along the west central claim boundary. Rock units are north-trending and east dipping. A west-southwest-trending shear zone transects the northeast portion of the claim.

CURRENT WORK AND RESULTS

In 1987 a 35.4 line-km grid with 50 m line spacing was established for control of VLF EM, HLEM and magnetic surveys. Numerous conductors and magnetic anomalies cluster in four broad north-northeast-trending zones. A total of 137 samples were collected from the property. The highest assay of 340 ppb Au was from a sample of felsic tuff with less than 1% pyrite.

DEC 1, 2 CLAIMS

Placer Dome Inc.	Gold
P.O. Box 49330,	76 D/6
Bentall Postal Station	64°21'N, 111°23'W
Vancouver, B.C., V7X 1P1	

REFERENCES

Dillon-Leitch (1979, 1981).
DIAND assessment reports: 081907, 082130, 082548.

PROPERTY

DEC 1, 2 (F10314-F10315)

LOCATION

The claims are approximately 255 km northeasterly from Yellowknife and 5 km northwest of Seahorse Lake (Fig. 8-79).

HISTORY

DEC 1 and 2 were staked to cover the volcanic-sediment contact. The claims, recorded in July 1983 for Colray Resources Inc., were optioned to Placer Development Ltd. In 1985 a 23 km grid was established and the area was evaluated by geological mapping, prospecting, "B-C" horizon soil sampling and VLF EM and magnetic surveys. Eight showings of arsenopyrite, spatially associated with the contact, were found. Arsenopyrite is concentrated in the silicified wall rock of apparently barren quartz veins. An exception was found where a quartz vein sample assayed 21.1 ppm Au and wallrock 2.5 and 0.33 ppm Au.

DESCRIPTION

The property is on the eastern margin of the northern end of the Courageous Lake-MacKay Lake volcanic belt. The eastern and southern part of the property is underlain by turbiditic sediments in contact with mafic volcanics to the west, which are intruded by biotite granite in the northern part of the property (Dillon-Leitch, 1981). The andalusite and sillimanite isograd trends west-northwesterly through the southern part of the property and metamorphic grade increases northwards. Basalts enclose layers of stratabound sulphide-facies iron formation (DIAND assessment report 082548). The turbidite-basalt contact is the locus for arsenopyrite bearing auriferous quartz veins.

CURRENT WORK AND RESULTS

In 1986, the grid was expanded to a total of 47 line-km to cover an additional 400 m south of the former grid and line spacing was reduced from 200 m to 100 m. Results from 24 line-km of VLF, magnetometer and geochemical surveys, prospecting and mapping were integrated with the results from the corresponding 1985 surveys. In addition, a 37.1 line-km IP survey was completed. A series of strong conductors were detected within the basalts, close to the contact, that were related to bands of sulphide-facies iron formation. Weaker conductors coincide with the volcanic-sediment contact and are in the sediments. Four main arsenopyrite-gold showings were identified. The zones comprise apparently barren quartz veins with arsenopyrite enriched wallrock and are controlled by a flexure in volcanic-sediment contact.

Thirty drill holes totalling 4167.7 m were completed in 1987. Seventeen holes, totalling 1666.4 m tested Zone I: the downdip projection of quartz-arsenopyrite stockworks; chargeability anomalies thought to indicate the lateral extension of Zone I; the volcanic-sediment contact; and a geophysical anomaly in volcanics to the west of the contact. The chargeability anomalies were attributed to pyritic schist with arsenopyrite laminae that was intersected in five drill holes. The best assay for Zone I was 1.51 ppm Au from a 0.5 m intersection of quartz with disseminated arsenopyrite. Zone II was probed by nine holes totalling 1868.7 m. The holes were designed to test both Zone II and the possible downdip extension of Zone I as well as a chargeability anomaly. Two drill holes intersected quartz veins, lenses and stringers including disseminations of arsenopyrite in schistose wallrock. Visible gold was noted in the core and the best assay of 23.2 ppm Au came from a 1 m intersection of a quartz vein with fracture controlled pyrite. A single 96.0 m drill hole probed Zone III and tested an associated chargeability anomaly. The Lake zone was evaluated by three drill holes totalling 536.6 m. A 0.5 m intersection of quartz with disseminated arsenopyrite in the wallrock assayed 5.2 ppm Au. Layers of sulphide-facies iron formation are enclosed by basalts of the Lake zone. A 0.5 m intersection of iron formation assayed 1.08 ppm Au.

NOV 5 CLAIM

Courageous Exploration Inc.	Gold
Suite 810, 540 5th Ave. SW	76 D/3
Calgary, Alta., T2P 0M2	64°13'N, 111°18'W

REFERENCES

McGlynn (1971), Moore (1956).
DIAND assessment reports: 017116, 082543.

PROPERTY

NOV 5 (F13168).

LOCATION

The NOV 5 claim is at the eastern tip of the northernmost shoreline of Courageous Lake (Fig. 8-79).

HISTORY

The ALPHA claims, held by the Big Four Syndicate covered the area in the late 1950s. In 1959, claims were mapped by G.W. McConnell (DIAND assessment report 017116). Auriferous quartz veins and stringers were discovered in sheared felsic volcanics. The report states that "a considerable amount of stripping and trenching was done by former owners on a number of zones on the property". But no record of this work was found. The claims cover the Kennedy showing, described by Moore (1956) and McGlynn (1971).

DESCRIPTION

The claim covers metamorphosed siltstone with lesser quartzite, phyllite and slate. A single outcrop of lithic tuff was mapped near the western boundary of the property. The Kennedy showing, 3.2 km east of the northeast bay of Courageous Lake at the northeast corner of the claim, is grey glassy quartz veins and is exposed in six trenches. Veins are lenticular, 5 to 30 cm wide and less than 10 m long. They contain galena, pyrite, arsenopyrite (DIAND assessment report 082543) chalcopyrite and ankerite (Moore, 1956). Gold is visible along cross fractures in the veins (Moore, 1956).

CURRENT WORK AND RESULTS

The NOV 5 claim was recorded January 6, 1986. Six days were spent in August, 1987 to establish a 10 km grid and complete magnetometer, VLF, soil and geological surveys of the grid area including the Kennedy showing. Four weak to moderate strength VLF conductors were detected, parallel to strike. Two hundred and twenty three soil samples were collected at 5 m intervals along grid lines. The sample interval was reduced to 2 m at VLF crossovers. Samples were analyzed for gold, arsenic and copper. None were anomalous. Ten grab samples collected from the Kennedy showing assayed up to 46.6 ppm Au.

LEAN CLAIMS

Noranda Exploration Company Ltd.	Gold
4 - 2130 Notre Dame Ave.	76 D/3
Winnipeg, Man., R3H 0K1	64°12'N, 111°12'W

REFERENCES

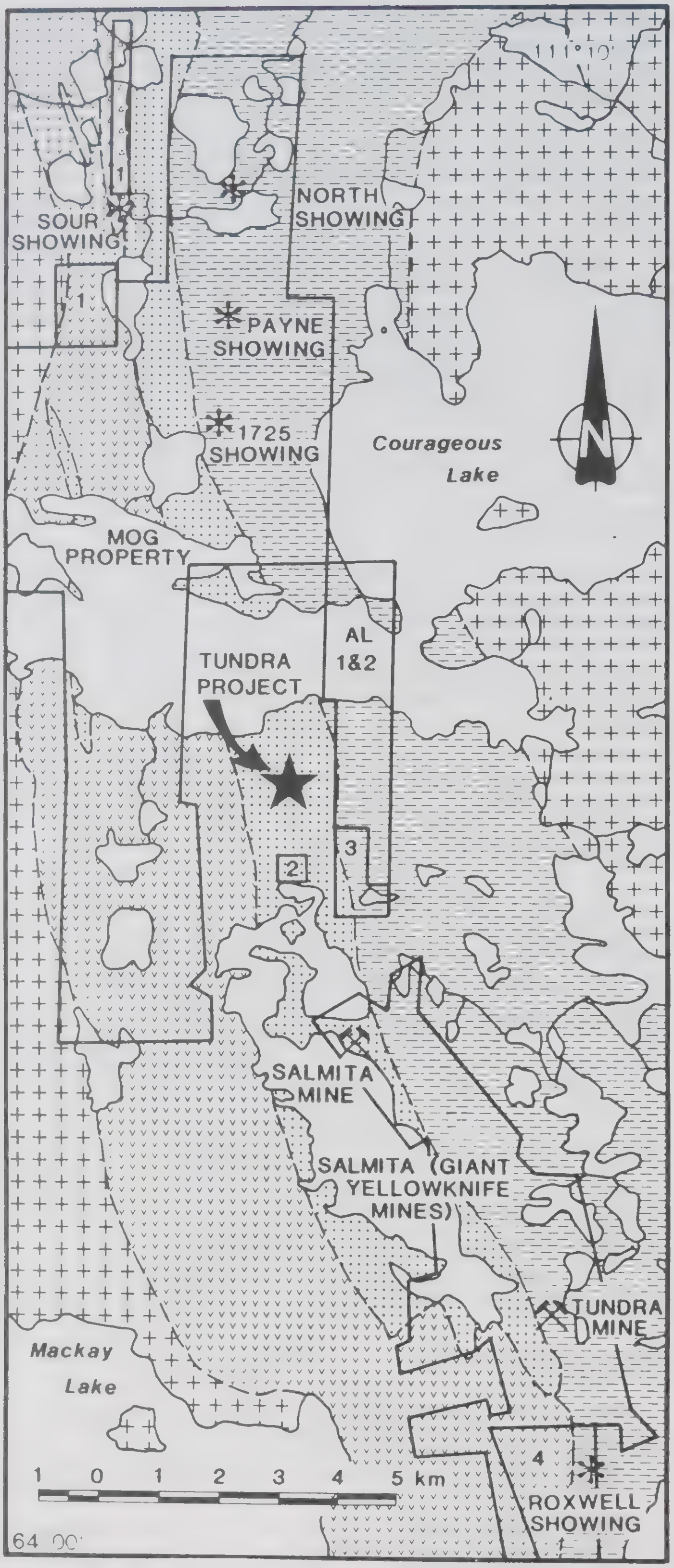
Moore (1956); Seaton (1983a,b, 1984).
DIAND assessment reports: 080988, 082414.

PROPERTY

LEAN 1-6 (A97764-69)
LEAN 7 (A97601)
LEAN 9-11 (A97611-97609).

LOCATION

The property is 240 km northeast of Yellowknife, approximately 2 km east of the north arm of Courageous Lake (Fig. 8-80).



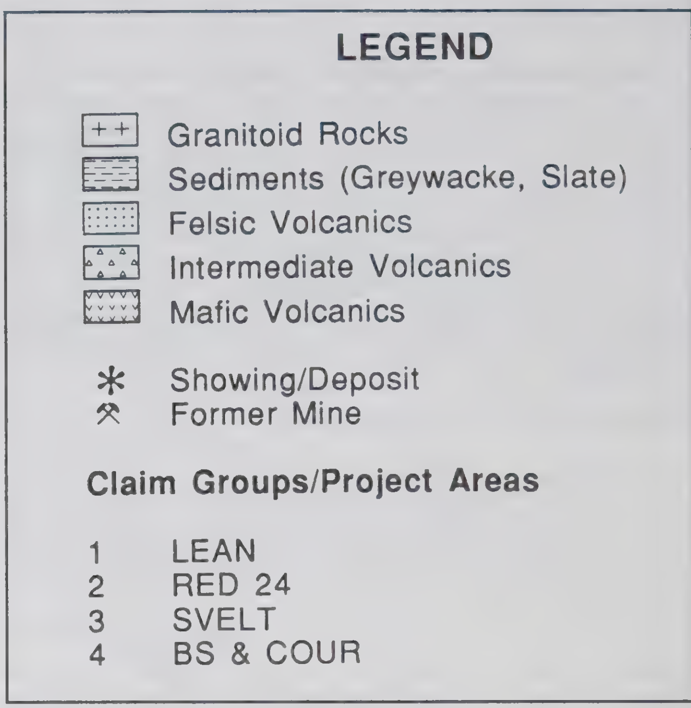


FIGURE 8-80: Geology and claims of the Courageous Lake-MacKay Lake volcanic belt, central section (after Dillon-Leitch, 1981).

HISTORY

The LEAN claims were staked in 1978 to cover an airborne conductor parallel to the volcanic-sediment contact, detected during Noranda's 1976 survey. In the same year, grids were established and EM, gravity and magnetic surveys delineated two zones of high conductivity and a third zone of poorly defined conductors. A single diamond-drill hole totalling 59.5 m tested a moderate EM conductor with a gravity expression. The hole intersected graphitic tuff breccias with up to 10% pyrite stringers, but no core was assayed. The LEAN claims were optioned to Getty Resources in 1981.

DESCRIPTION

The geology of the LEAN group is described by Fraser (DIAND assessment report 080988) as a complex area of thinly alternating layers of mafic, felsic and intermediate volcanics and sediments on the flank of the Courageous Lake-MacKay Lake volcanic belt.

CURRENT WORK AND RESULTS

During 1987, a perimeter survey was completed on the LEAN claims to bring the claims to lease. A 6.7 line-km grid was chained and picketed. A 5.6 line-km VLF EM survey was completed to extend 1978 coverage. Three parallel north-northeast-trending conductive zones were detected approximately parallel to, but not coincident with, the trend of anomalies delineated by the 1976 survey.

MOG Property

Mill City Gold Corp./ Gunnar Gold Inc.
850, 11012 MacLeod Trail SE
Calgary, Alta., T2J 6A5

Gold
76 D/3
64°10'N, 111°19'W

REFERENCES

Lord (1951); Moore (1956); Dillon-Leitch (1981).
DIAND assessment reports: 061295, 080987, 081832, 082464, 082303, 082615.

PROPERTY

MOG 1-4 (F10287-90)
BULL 3 (F11583)
BULL 4 (F10334)
ML 3132 (BLAKE 25-32).

LOCATION

The claims are 250 km northeast of Yellowknife and straddle the central narrow reaches of Courageous Lake (Fig. 8-80).

HISTORY

In 1945 the MINT group was staked to cover auriferous quartz stringers on ground now covered by MOG 1-4. The claims were acquired in 1946 by Payne Yellowknife Gold Mines Ltd. and stripping, trenching and 247 m of diamond drilling in eight holes tested the showings (DIAND assessment report 082464; NMI 76 D/3 Au4). The claims lapsed after 1953.

The BLAKE claims, immediately west of the area now covered by the MOG claims, were staked in 1973 and explored in 1976 by means of VLF EM and geochemical surveys. Weak to moderate VLF EM conductors trending sub-parallel to the volcanic-sediment contact and three arsenic anomalies in soils were detected.

In 1976, Noranda Exploration flew an EM survey over the area which detected several conductors immediately south of Courageous Lake that were subsequently staked as the THIN claims. In 1977, a grid was established and VLF, VLEM, HLEM, magnetic, gravity and geological surveys were completed. A combined EM and magnetic anomaly with a weak gravity expression was tested by a single drill hole of 61.5 m. The hole cut mafic to intermediate volcanics and tuffs with pyrite-pyrrhotite stringers. Narrow intersections of up to 0.046% Cu and 0.031% Zn were recovered (DIAND assessment report 080987). The claims lapsed.

MOG 1-4 and BULL 3 and 4 were registered by H. Mogenson in 1983. In 1984, Cominco optioned the MOG claims and carried out geological mapping, VLF EM and magnetic surveys and geochemical sampling. In the following year, the BULL claims were optioned by Cominco, existing grids were extended and IP, VLF EM and magnetic surveys were completed on both claim groups (DIAND assessment reports: 081832, 081953). Two showings were examined and a third was discovered. Four drill holes, to test an IP anomaly under Courageous Lake, intersected barren pyritic tuff.

DESCRIPTION

The property is underlain by massive and pillowed basalt flows and amygdaloidal andesite that flank a granodiorite batholith immediately west of the claims. A thin unit of rhyolite block breccia (possibly Cycle One) enclosed by mafic volcanics, trends north-northwest in the eastern portion of the property. Mafic volcanics are overlain by rhyolite flows (Cycle Two). MOG 1 and 4 cover greywacke, slate and arkose turbidites that overlie the volcanic assemblage (Dillon-Leitch, 1981).

CURRENT WORK AND RESULTS

Four drill holes totalling 676 m on the MOG claims and six holes totalling 562 m on the adjacent BLAKE claims were completed on the ice of Courageous Lake. All holes intersected calcareous felsic lapilli tuff with up to 10% very fine-grained disseminated pyrite and pyrrhotite. The unit is thought to be the northern extension of the Carbonate zone of the Tundra project, described in this chapter.

The MOG claims were transferred back to H. Mogenson in August, 1986 and were optioned by Mill City Gold Corp. (50%) and Gunnar Gold Inc. (50%) in the summer of 1987. MPH Consulting Ltd, was contracted to survey a 300 km grid; 258 km of magnetic surveys and 243 km of VLF EM surveys at 100 m line spacing with 43 km of IP/resistivity surveys at 200 m line spacing were completed. The reconnaissance IP surveys covered much of the area from the south shore of Courageous Lake to the north end of the claim group. No distinct magnetic anomalies were found on the north claims. Magnetic highs on the south claims were related to synvolcanic mafic intrusions or diabase dykes. Combined results of the VLF EM and IP survey indicate two linear trends on the north claims. The first trend corresponds to graphitic argillite layers within sediments and the second trend is related to zones of shearing or faulting.

The Payne showing, a quartz vein zone in chlorite schist is exposed in a trench. Samples from the trench, bearing pyrite and arsenopyrite, assayed up to 1.3 ppm Au. The 1725 showing and a newly discovered showing of dark grey quartz veins in sericite chlorite schist were examined and sampled.

Based on the geophysical results, 3000 m was planned. However, drilling was abandoned due to weather conditions after the completion of one 168.25 m hole. The hole targeted a broad IP anomaly on strike with the Tundra Project Main zone and intersected isoclinally folded argillite and greywacke with interlayered felsic volcaniclastics.

AL CLAIMS

Courageous Exploration Inc.
Suite 810, 540 5th Ave. SW
Calgary, Alta., T2P 0M2

Gold
76 D/3
64°07'N, 111°15'W

REFERENCES

DIAND assessment report: 082636.

PROPERTY

AL 1-2 (F10291-F10292).

LOCATION

The property is 240 km northeast of Yellowknife and 4 km north of the Salmita Mine. The claims border BERTHA 1 and 2 of Noranda's Tundra Project (Fig. 8-80).

HISTORY

The exploration history for the area is summarized under the description for the Tundra Project. AL 1 and 2 were staked in 1983 by Lorne McNeice and transferred to American Chromium in 1984.

DESCRIPTION

The claim covers greywackes, slates and phyllites of the Yellowknife Supergroup. Felsic tuff to lapilli tuff outcrop in the southwest corner of AL 1. Rocks strike 355° and dip subvertically. They are cut by east-trending gabbro dykes.

CURRENT WORK AND RESULTS

The claims were acquired by Courageous Exploration Inc. in April, 1987. Between August 15-23, the property was explored by magnetometer, VLF EM, geochemical and geological surveys. A 14 km square grid was established over the southern end of AL 1 for control of VLF EM and magnetometer surveys. A linear weak to moderate strength conductor strikes 350° and dips to the east. Two hundred and forty-three soil samples were collected from frost boils and analyzed for gold, arsenic and copper. There is no clearly defined distribution of anomalous soils.

SVELT 2 CLAIM

Noranda Exploration Co. Ltd.	Gold
4 - 2130 Notre Dame Ave.	76 D/3
Winnipeg, Man., R3H OK1	64°06'N, 111°15'W

REFERENCES

Moore (1956); Seaton (1983a, 1983b, 1984).
DIAND assessment report: 082521.

PROPERTY

SVELT 2 (F10671).

LOCATION

The claim is at Matthews Lake, 235 km northeast of Yellowknife (Fig. 8-80).

HISTORY

SVELT 2 was staked in 1983. No previous work has been recorded for the immediate area. A history of exploration for the adjacent area is described under the Tundra Project.

DESCRIPTION

There is less than 5% outcrop on the property. Frostheave blocks and talus piles are greywacke, arkose and slates of the Yellowknife Supergroup. Sediments are strongly foliated and steeply dipping. An assumed north-westerly striking fault, occupied by a topographic low, displaces the east-trending gabbro dyke cutting the northwest corner of the claim. Adjacent outcrop exposures are brecciated with quartz carbonate filled fractures (DIAND assessment report 082521).

CURRENT WORK AND RESULTS

A day was spent in 1987 for reconnaissance of the claim. Nine grab samples were taken for geochemical analysis. Samples assayed up to 40 ppb Au.

TUNDRA PROJECT (FAT DEPOSIT)

Noranda Exploration Co. Ltd.	Gold
4 - 2130 Notre Dame	76 D/3
Winnipeg, Man., R3H 0K1	64°06.7'N, 111°16.3'W

REFERENCES

Comeau *et al.* (1987); Comeau (1990); Seaton and Crux (1985); Seaton *et al.* (1987).
DIAND assessment reports: 017117, 080907, 081689, 081894, 081900.

PROPERTY

FAT and BERTHA leases.

LOCATION

The property is approximately 200 km northeast of Yellowknife, between Matthews Lake and Courageous Lake and about 4 km north-northwest of the Salmita Mine (Fig. 8-80).

HISTORY

The area of the Fat deposit was held in 1946 as the NASH, KB and TPR claims (Seaton and Crux, 1985). The first recorded work was in 1964 when Giant Yellowknife Mines staked the RED group of 23 claims over the area north of Matthews Lake. At the time it was noted that several small pits and trenches and a few small diamond drill holes were found on the RED claims (DIAND assessment report 017117). The claims were explored in 1965 by magnetometer and EM surveys. Conductors were tested by four holes totalling 663 m (DIAND assessment report 017117; NMI 76 D/3 Au1). RED 24 was acquired by Giant Yellowknife Mines in 1973 and is described in Chapter 2. RED 1-23 lapsed by 1975.

In 1976 Noranda began reconnaissance of the Courageous Lake-MacKay Lake volcanic belt, followed by a combined airborne EM and magnetic survey of the area, to evaluate the base metals potential of the region. The FAT claims were staked for Noranda in the spring of 1977 to protect geophysical anomalies north of Matthews Lake. Grids were established over AEM responses south of Courageous Lake (Fat IV Grid) and southeast of the mouth of Matthews Creek (Fat II Grid). CEM, VLEM, magnetic and geological surveys were completed on both grids, and a gravity survey was completed on the grid near Courageous Lake. A number of conductive zones were outlined that were attributed to pyrrhotite. A sample of pyrite and pyrrhotite bearing felsic tuff collected from the Fat IV grid

assayed 18.9 ppm Au (DIAND assessment report 080907).

In 1979 Getty Canadian Metals (49%) and Noranda Exploration (51%) formed a joint venture to continue exploration of the belt. By 1981 exploration emphasis shifted from base metals to gold. FAT 63-67 had lapsed and BERTHA 1 was staked to cover the area. The Fat IV grid was restored to control geological and magnetic surveys. A succession of felsic lapilli and crystal tuff and agglomerate with local disseminations of arsenopyrite, pyrite and pyrrhotite were mapped. The highest assay reported from the nineteen samples collected was 59.0 ppm Au.

In 1982 magnetic and IP surveys were completed over the grid and two holes totalling 290 m were drilled from a single collar to probe part of what is now known as the Main zone. Intersections of arsenopyrite bearing tuff yielded up to 8.0 ppm Au over 4 m (DIAND assessment report 081689). In 1983 total field and vertical gradient magnetic surveys were completed over the grid. The area was prospected and 14 samples were collected. Half the samples contained more than 500 ppb Au and four samples assayed more than 1 ppm Au. Nine holes totalling 1090 m were drilled (Seaton and Crux, 1985) to test a 450 m strike length of the Main zone. All holes intersected auriferous zones (DIAND assessment report 081900).

In the spring and fall of 1984, 36 drill holes totalling 6,243 m tested the Main zone and other exploration targets including the Carbonate zone (Seaton *et al.*, 1987). A total field magnetometer survey was conducted in the spring (DIAND assessment report 081894). BERTHA 1 and adjoining portions of the FAT claims were converted to mining leases in July 1984. Exploration during the summer consisted of regridding, remapping, sampling, trenching, outcrop stripping and IP and HLEM surveys (Seaton *et al.*, 1987).

During 1985 the Fat IV grid was extended south to include a portion of Matthews Lake. Magnetic and VLF EM surveys were completed over the grid. The magnetic survey defined units of mafic and felsic volcanics and northerly trending diabase dykes. Local magnetic features were attributed to pyrrhotite concentrations, mafic rocks, and in one instance, an alteration zone in felsic volcanics. Several VLF conductors were outlined, some coincident with magnetic highs (Seaton *et al.*, 1987). Late in the year, three deep holes were drilled to a vertical depth of 490 m to test the downdip continuity of the auriferous zones. The best intersection of 19.2 ppm Au over 6.1 m true width was recovered from -365 m (Getty press release, June 24, 1987). At the completion of work in 1985, probable resources for the Main zone along a strike length of 1.2 km and to a vertical depth of 120 m were estimated to be 1 160 000 t averaging 9.6 ppm Au and estimates for the Carbonate zone were 900 000 t averaging 12 ppm Au (NMI 76 D/3 Au7).

DESCRIPTION

The following is summarized from Comeau *et al.* (1987, 1990):

The Main and Carbonate zones are in a sequence of rhyodacitic to rhyolitic pyroclastics and volcaniclastics (Fig. 8-81), divided into a lower and upper cycle. The lower cycle comprises rhyodacitic flows up to 400 m thick, overlain by 45 to 150 m of calcareous sediments, the Carbonate zone, with abundant interlayers of rhyodacitic lapilli in a calcareous matrix. A narrow layer of locally graphitic pelitic sediments is found at the top of the lower cycle. The base of the upper cycle of volcanics is 180 to 300 m of rhyodacitic lapilli tuff to agglomerate overlain by felsic volcaniclastics transitional to Yellowknife Supergroup sediments.

The Main zone, multiple auriferous vertically dipping shear zones, subparallel to strata, varies from 100 to 250 m wide. The zone was traced for a strike length of more than 1.5 km and is open at depth. Shear zones exhibit a characteristic alteration assemblage of arsenopyrite, sericite and silicification. Chalcopyrite, sphalerite and scheelite have been identified within the zones but are rare. Within the shear zones sericite locally, or totally, replaces the host rock and arsenopyrite forms dense felted masses within sericitized rock, or disseminations of acicular crystals. Silicification is characterized by blue-grey quartz veins and infusions. Gold fills fractures within sulphides, particularly arsenopyrite. Native gold is rare and restricted to quartz veins.

Magnetic and IP surveys were used extensively to define drill targets. The deposit has a characteristic magnetic signature and can be outlined by IP responses.

CURRENT WORK AND RESULTS

In late 1986 five holes totalling 3050 m tested the downdip continuity of the Main zone. Multiple ore-grade intersections (Table 8-9) were recovered to a vertical depth of 500 m (Getty 1987 Annual Report). In 1987, more than 36 000 m of drilling probed a 1.5 km strike length of the Main zone (Northern Miner 87/07/06; Getty Press Release, November 1987; Getty December 1987 Interim Report).

TABLE 8-9: 'NOTEWORTHY' INTERSECTIONS, 1986 DRILLING

	From (m)	to (m)	Cored Interval (m)	g/t Au
F-40	342.9	346.9	4.0	11.0
		Includes	2.5	14.4
	442.5	448.5	6.0	9.3
F-41	240	253.2	13.2	11.0
		Includes	5.5	18.9
	345	348	3.0	8.9
	391.5	404.4	12.9	8.9
		Includes	4.9	12.3
	445.3	448.8	3.5	11.3
	473.3	481.3	8.0	14.4
		Includes	5.5	17.8
	508.9	515.4	6.5	5.8
F-42	174.5	184	9.5	7.8
		Includes	3.5	9.9
F-43	158.0	166.0	9.0	6.8
	178.0	185.0	7.0	7.8
		Includes	2.0	13.7
	203.5	215.2	11.7	8.2
		Includes	3.5	14.7
F-44	132.0	137.0	5.0	6.5
	272.0	273.5	1.5	16.5
	296.0	299.0	3.0	7.5

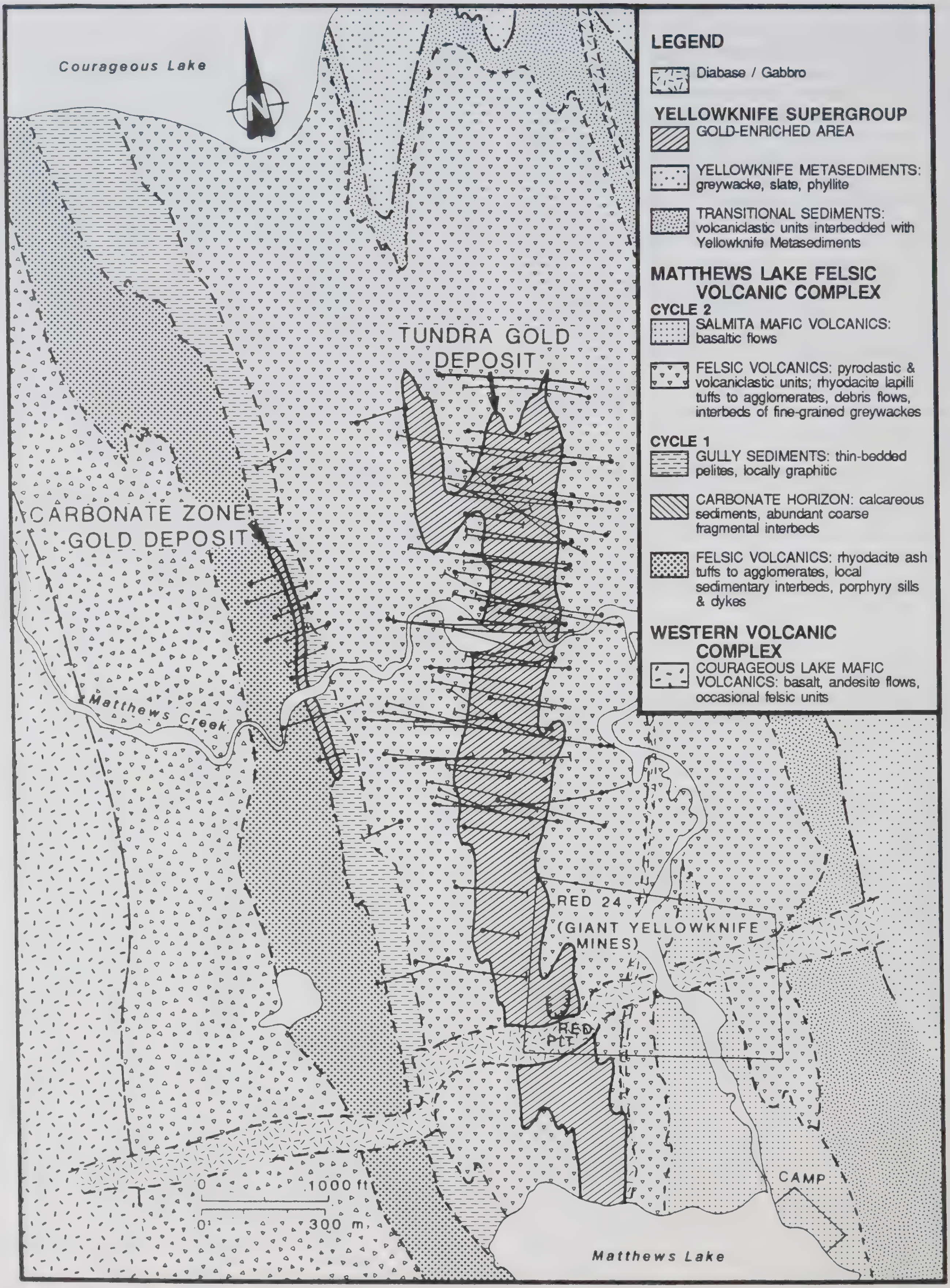


FIGURE 8-81: Geology and drill hole plan of the Tundra gold deposit (after Comeau, 1987 and 1990)

Metallurgical tests utilizing oxygen pressure leach and roasting were preformed by Lakefield Research (Canadian Mining Journal, September 1987) and Sherritt Gordon Mines (NMI 87/09/21) on composite samples (Comeau *et al.*, 1987) to determine the most efficient extraction method. The bioleaching method (as described for RED 24) was also considered. Tests showed that the ore is refractory and gold is confined mainly to arsenopyrite, and to a lesser extent, pyrite and pyrrhotite. Approximately 3% of the gold is free milling. Direct cyanidation can recover 25 to 30% of the gold and a standard flotation circuit can recover 90% of the gold. Up to 98% of the gold is recoverable if the sulphides minerals are decomposed by pressure oxidation techniques. Drill core from shallow holes was tested by Lakefield Research utilizing oxygen pressure leach and roasting. Gold recovery rates of 93% were achieved (Canadian Mining Journal, September 1987).

In September 1987, the joint venture partners announced plans for underground exploration that included sinking a vertical exploration shaft to the -450 level, drifting, underground drilling, raising to collect a bulk sample and metallurgical testing (NMI 87/09/21, Getty Resources Ltd. Interim Report December 1987).

At the end of 1987, the estimated undiluted geological reserves (excluding results from the final eight holes completed in 1987) were: 24 Mt at 6.2 ppm Au using a cutoff of 3.4 ppm Au; 8.4 Mt of 8.9 ppm Au using a cutoff of 6.8 ppm; or 1.9 Mt of 13.4 ppm Au using a cutoff of 10.3 ppm Au.

BS AND COUR CLAIMS

Bow Valley Industries	Gold
2020 - 1177 W. Hastings St.	76 D/3
Vancouver, B.C., V6E 2K3	64°00'30"N, 111°30"W

REFERENCES

Seaton (1984).
DIAND assessment reports: 082387, 082456, 082546.

PROPERTY

BS 1 (F04324)
BS 2 (F09123)
COUR 1 (F05778).

LOCATION

The property is 235 km northeast of Yellowknife and 7.5 and south of the Salmita Mine (Fig. 8-80).

HISTORY

In 1945, the Tundra, Salmita and BS showings were staked as the JEJA and ROMA claims. In 1950, Homer Yellowknife Gold Mines optioned the claims and drilled eight holes totalling 614.3 m to test the Perrson vein (DIAND assessment report 082387). The claims lapsed and were restaked by Goldcrest Mines Ltd. in 1958 as the DON claims. The DON claims were explored by trenching, mapping and 2347 m of diamond drilling in 36 holes to test two zones on the Perrson vein and the Saucer Lake showing (DIAND assessment report 082456). Reserves of the Perrson vein and the Saucer Lake showing are estimated by Roxwell Gold Mines (1983 Prospectus) to be 125 600 t proven and 190 500 t probable at a weighted grade average of between 4.5 ppm to 5.1 ppm Au. The claims lapsed in 1970 and were restaked as the TK claims. The TK claims were optioned in 1973 by Golden Ram and explored by VLF EM surveys and trench sampling. The option expired and the claims were optioned again in 1974 by Perry River Nickel Mines and evaluated by geochemical and geophysical surveys.

In 1978 claims of the TK group lapsed. BS 1 and 2 were staked and acquired by Roxwell Gold Mines. Geochemical and VLF EM surveys were completed over a grid established on BS 2. Ten diamond-drill holes totalling 515 m tested various targets (Seaton, 1984).

In 1983, Giant Yellowknife Mines optioned BS 1 from Roxwell Gold Mines and explored with IP, resistivity and magnetic surveys and one drill hole totalling 151 m. The hole intersected a zone 8.7 m in true width containing 6.7 ppm Au (Seaton *et al.*, 1987). Geological and geophysical survey areas were extended in the following year, the 1983 drill hole was deepened by 58.73 m and six new holes totalling 1175 m were completed. COUR 1 was staked in the same year. Giant, in a joint venture with Cominco, completed three drill holes totalling 647 m in 1985, before the option was terminated.

DESCRIPTION

Mafic flows and tuffs grade upward into mixed mafic and felsic tuffs and then to felsic tuffs. The volcanic assemblage is in contact with well bedded slates, phyllites, argillites and arkosic to quartzose greywacke with minor interbeds of felsic tuff. The Saucer Lake showing comprises abundant quartz stringers in cross-cutting and conformable relationship with enclosing mafic and felsic tuffs. Sulphides, typically pyrite and arsenopyrite, form clots and crystals in both the hanging wall and footwall. The Saucer Lake showing is continuous with the Perrson vein, 425 m to the north. The Perrson vein is enclosed by felsic tuffs near the mafic contact. The vein ranges from 2.15 to 8.6 m in true width.

CURRENT WORK AND RESULTS

In the summer of 1987, two diamond drill holes totalling 424.9 m, probed the Perrson vein. Both holes cut sequences of mixed mafic and felsic tuffs, felsic tuffs and sediments. A 3.1 m intersection of 4.3 ppm Au was recovered from one hole and an intersection of 1.3 m of 2.1 ppm Au from the other.

INKA AND BERTHA CLAIMS

Noranda Exploration Co. Ltd.	Base Metals
4 - 2130 Notre Dame Ave.	75 M/14
Winnipeg, Man., R3H 0K1	63°55'N, 111°10'W

REFERENCES

DIAND assessment reports: 081445, 082418, 082777.

PROPERTY

INKA 1 (F08956)
INKA 2 (F01215)
BERTHA 5 (F08955).

LOCATION

The claims are at the Nodinka Narrows on MacKay Lake, about 225 km northeast of Yellowknife (Fig. 8-82).

HISTORY

INKA 2 was formerly held by Noranda as HARE 1. HARE 2-6 were explored in the summer of 1980 by VLEM, HLEM, VLF EM, magnetic and geological surveys. HARE 1 was on strike with a north-northwest-striking conductor and coincident magnetic anomaly, detected at the north end of HARE 2 on the south shoreline of Nodinka Narrows. Four holes totalling 85.2 m were drilled on HARE 2-6 to test geophysical targets. HARE 1 lapsed in June 1982 (DIAND assessment report 081445). INKA 1 and 2 and BERTHA 5 were staked by Noranda Exploration Co. Ltd. in the summer and autumn of 1983 to cover the possible on strike extension of EM and magnetic anomalies detected during Noranda's 1976 airborne survey of the belt.

DESCRIPTION

The INKA claims cover the Nodinka Narrows and exposure is limited to the tip of a peninsula in the southeast corner of INKA 1. BERTHA 5 covers north-northwest-striking, steeply dipping mafic flows and tuffs overlain by dacite and rhyolite tuffs. The volcanic assemblage is in contact with argillites, greywackes and arkoses of the Yellowknife Supergroup (DIAND assessment report 082777).

CURRENT WORK AND RESULTS

An 88.05 km grid was established during the winter of 1987 and 82.35 km of VLF EM and magnetometer surveys were completed. VLF EM readings were taken every 25 m and magnetometer readings every 12.5 m spacings. Three strong conductive zones coincident with magnetic and airborne anomalies were identified.

NOD Claims

Consolidated Parklane
Resources Inc.
Box 10
1000 - 609 W. Hastings St.
Vancouver, B.C., V6B 4W4

Gold
75 M/14
65°53'N, 111°05'W

REFERENCES

Folinsbee (1949); Henderson (1944); Moore (1956).
DIAND assessment reports: 081826, 082240.

PROPERTY

NOD 1-4 (F11641-F11645).

LOCATION

The property is on a peninsula on the south shore of MacKay Lake at Nodinka Narrows, 230 km northeast of Yellowknife and 17 km south of the Salmita Mine (Fig. 8-82).

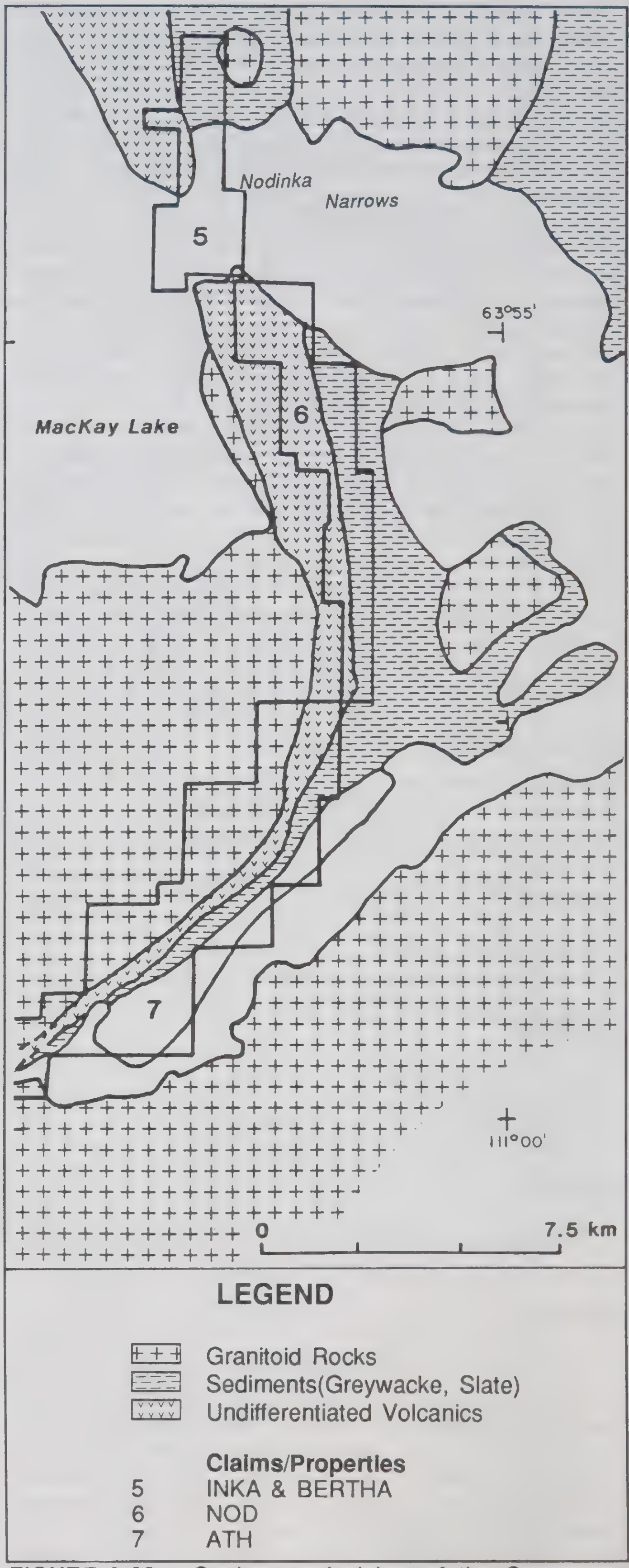


FIGURE 8-82: Geology and claims of the Courageous Lake-MacKay Lake volcanic belt, south section (after Dillon-Leitch, 1981 and Henderson, 1944).

HISTORY

The claims were staked in 1983. Highwood Resources Ltd. acquired the property the same year and conducted reconnaissance geological mapping, sampling and VLF EM surveys. In 1984, Cominco optioned the claims and carried out additional geological mapping, sampling and a reconnaissance IP survey (DIAND assessment report 081826). A coincident high-chargeability and low-resistivity anomaly was detected on the southernmost of the IP survey lines on NOD 2 and two rock geochemical anomalies were found on NOD 3. The claims were returned to Highwood in 1985.

DESCRIPTION

The property covers the contact between sediments to the east and underlying volcanics of the Courageous Lake-MacKay Lake volcanic belt to the west (Folinsbee, 1949; Henderson, 1944; Moore, 1956). Volcanics are predominantly mafic. A narrow unit of felsic volcanics at the volcanic-sediment contact is coincident with an IP anomaly and a rock geochemical anomaly (90 ppb Au obtained by Cominco). Immediately west of the felsic unit is a thicker interval of mixed mafic and felsic volcanics. A granitic batholith is west of the claims and smaller granitic plugs intrude the supracrustals on NOD 3 and NOD 4.

CURRENT WORK

The claims were transferred to Parklane Technologies Inc. in October, 1986. In February 1987, a 6.3 line-km grid was established over the sediment-volcanic contact for control of total-field magnetometer, vertical-gradient magnetometer and VLF EM surveys. The geophysical surveys identified a magnetic and conductive anomaly coincident with the IP anomaly detected by Cominco. Several magnetic anomalies, not associated with conductors, were attributed to diabase dykes.

ATH CLAIMS

Roxwell Gold Mines Ltd.	Gold
P.O. Box 190	75 M/11,12,14
Lions Bay, B.C., V0N 2E0	63°42'N, 111°34'W

REFERENCES

Henderson (1944).
DIAND assessment reports: 082537, 082538.

PROPERTY

ATH 1 (F12706)
ATH 4 (F12709)
ATH 6-8 (F12711-F12713)
ATH 16-18 (F12721-F12723)
ATH 19-21 (F14377-F14379).

LOCATION

ATH 1,4, 6-8 and 16-18 are along the west shore of Portage Bay of MacKay Lake approximately 222 km northeast of Yellowknife. ATH 19-21 extend to the southeast (Fig. 8-82).

HISTORY

Henderson (1944) mapped the property as granite with the exception of the areas of ATH 1 and 8. No claims were recorded for the area prior to the ATH claims. ATH 1-8 and 16-18 were staked and registered in 1985 by A. Shearcroft. In May 1987, ATH 1, 4-8, 16-18 were transferred to Roxwell Gold Mines Ltd. who acquired ATH 19-21 from B. Weir in November of 1987.

DESCRIPTION

The belt of supracrustal rocks, up to 910 m wide in the northeast narrowing to 210 m wide in the southwest, transects the claims and occupies a topographic low. Green to black basaltic flows in the northwest overlie schistose greywacke to the southeast (DIAND assessment report 082538). The rocks strike northeast and dip steeply south. This extends the Courageous Lake-MacKay Lake volcanic belt 7.8 km further southwest than shown by Henderson (1944).

CURRENT WORK AND RESULTS

In 1987, after preliminary geological mapping confirmed the Courageous Lake-MacKay Lake volcanic belt extends onto the property, Aerodat Ltd. was contracted to fly a 400 line-km VLF EM, EM and magnetic survey. Survey results for ATH 1,4, 6-8 and 16-18 indicate that there are: a group of mafic dykes trending northeast cut by a group of mafic dykes trending north-northwest; a series of east-northeast-trending faults; bedrock resistivity lows and several conductors, some coincident with volcanic rocks and mafic dykes.

REFERENCES

Allan, R.J. and Cameron, E.M., 1973:
Uranium, zinc, lead, manganese, iron, organic matter, copper, nickel and potassium content of lake sediments, Bear-Slave Operation, District of Mackenzie; Geological Survey of Canada, Maps 9-1972 to 15-1972.

Allan, R.J., Cameron, E.M. and Durham, C.C., 1973a:
Reconnaissance geochemistry using lake sediments of a 36,000 square mile area of the northwestern Canadian Shield; Geological Survey of Canada, Paper 72-50, 70 p.

______, 1973b:
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